NOTICES OF PUBLIC INFORMATION

Notices of Public Information contain corrections that agencies wish to make to their notices of rulemaking; miscellaneous rulemaking information that does not fit into any other category of notice; and other types of information required by statute to be published in the *Register*. Because of the variety of material that is contained in a Notice of Public Information, the Office of the Secretary of State has not established a specific format for these notices.

NOTICE OF PUBLIC INFORMATION

DEPARTMENT OF ENVIRONMENTAL QUALITY

[M08-321]

1. Title and its heading: 49, The Environment
Chapter and its heading: 2, Water Quality Control
Article and its heading: 2.1, Total Maximum Daily Loads
A.R.S. section: 49-232, Lists of Impaired Waters; data requirements; rules

2. The public information relating to the listed statute:

Arizona Revised Statute (A.R.S.) § 49-232(A) requires the Arizona Department of Environmental Quality (ADEQ) to prepare a list of impaired waters at least once every five years in order to comply with §303(d) of the Clean Water Act [33 U.S.C. 1313(d)]. ADEQ is required to provide public notice and allow for comment on a draft §303(d) list of impaired waters prior to its submission to the United States Environmental Protection Agency (EPA). ADEQ published a draft §303(d) list in a document entitled *2006 Status of Ambient Water Quality in Arizona, Arizona's Integrated 305(b) and 303(d) Listing Report* (Draft February, 2007) (hereafter referred to as the "Integrated Report) and provided an opportunity for public comment on the Integrated Report from March 1, 2007 through March 30, 2007. ADEQ must prepare written responses to public comments received on the draft §303(d) list of impaired waters and publish a summary of ADEQ's responses to comments in the *Arizona Administrative Register*. Finally, ADEQ is required to publish the list of impaired waters that it plans to submit to EPA at least 45 days before submitting the list to EPA. ADEQ has combined the 2006 and 2008 303(d) Lists. No new data was evaluated for the 2008 303(d) List so it is identical to the 2006 303(d) List. For this reason, ADEQ did not feel it was necessary to hold a separate public comment period for the combined List.

3. Procedures for challenging an impaired water listing:

The publication of the §303(d) list of impaired waters in the *Arizona Administrative Register* is an appealable agency action. Any party that submitted written comments on ADEQ's draft §303(d) list may challenge a listing of an impaired water by submitting a notice of appeal to the Department in accordance with A.R.S. § 41-1092.03. A notice of appeal challenging a listing must be submitted within 45 days of the date of publication of this notice of public information in the *Arizona Administrative Register*. The submission of a timely notice of appeal "stays" ADEQ's initial submission of a challenged listing to EPA. ADEQ may subsequently submit a challenged listing to EPA if the challenged listing is upheld in a final administrative decision by the Director under A.R.S. § 41-1092.08 or if the person who challenges a listing withdraws the appeal prior to a final administrative decision by the Director.

4. §305(b) and §303(d) of the Clean Water Act:

§305(b) of the Clean Water Act requires each state to prepare and submit to EPA a biennial report describing the water quality of all surface waters in the state. Each state must monitor water quality and review available data and information from various sources to determine if surface water quality standards are being met. From this §305(b) water quality assessment report and other sources of information, ADEQ creates the §303(d) list. The §303(d) list identifies Arizona surface waters that do not meet water quality standards. These waters are known as "water quality limited segments" or "impaired waters." Identifying a surface water as impaired may be based on an evaluation of physical, chemical, or biological data demonstrating evidence of a numeric standard exceedance, a narrative standard exceedance, designated use impairment, or a declining trend in water quality, such that the surface water would exceed a water quality standard before the next listing period. ADEQ identifications of impaired waters on the 2006/2008 §303(d) list are based on evidence of exceedances of numeric water quality standards.

§303(d) of the Clean Water Act requires each state to prepare several lists of surface water segments not meeting surface water quality standards, including those not expected to meet state surface water quality standards after implementation of technology-based controls. The draft §303(d) list is revised based on public input and finalized for submission to EPA. Arizona, like most states, prepares one list containing all of the waters meeting the criteria in section §303(d). At a minimum, ADEQ must consider the following sources of data:

- Surface waters identified in the §305(b) Report, including the §314 lakes assessment that do not meet water quality standards;
- Surface waters for which dilution calculations or predictive models indicate nonattainment of water quality standards;
- Surface waters for which problems have been reported by other agencies, institutions, and the public;

- Surface waters identified as impaired or threatened in the state's non-point assessments submitted to EPA under §319 of the Clean Water Act;
- Fish consumption advisories and restrictions on water sports and recreational contact;
- Reports of fish kills or abnormalities (cancers, lesions, tumors);
- Water quality management plans;
- The Safe Drinking Water Act §1453 source water assessments; and
- Superfund and Resource Conservation and Recovery Act (RCRA) reports and the Toxic Release Inventory.

ADEQ's §303(d) list and supporting documentation are submitted to EPA for review. The ADEQ submission to EPA will contain the §303(d) list, including the pollutants or suspected pollutants impairing water quality; the surface waters targeted for Total Maximum Daily Load (TMDL) development; a priority ranking and schedule for TMDL development; a description of the process used to develop the §303(d) list; the basis for listing decisions, including reasons for not including a surface water or segment on the list; and a summary of ADEQ responses to public comments received on the draft list. 40 CFR 130.7(b)(6)(iv) requires a state to demonstrate "good cause" for not listing a surface water where there are exceedances of water quality standards and places the burden of proof on the state to justify excluding a surface water from the list. "Good cause" factors include more recent or accurate data, flaws in the original analysis, more sophisticated water quality modeling, or changes in the conditions that demonstrate that the surface water is no longer impaired.

The §303(d) list was due to be submitted to the U.S. Environmental Protection Agency on or before April 1, 2006. State law requires that the initial §303(d) list be published in the *Arizona Administrative Register* at least 45 days before the list is submitted to the Regional Administrator. The list of impaired waters that ADEQ plans to submit to EPA is contained in the table titled "Surface Waters Assessed as Impaired by ADEQ" published in this notice.

During the past two assessment cycles (2002 and 2004), EPA has added impaired waters to Arizona's §303(d) list. For the 2006/2008 assessment cycle, ADEQ is providing a *separate* §303(d) list showing EPA listings of impaired waters added by EPA in 2002 and 2004 titled "Surface Waters Added to Arizona's List of Impaired Waters by EPA." These EPA listings do not meet the requirements of A.R.S. § 49-232 or impaired water identification criteria established in ADEQ's Impaired Water Identification Rules (A.A.C. R18-11-601 through R18-11-606).

5. Arizona laws governing ADEQ identification of impaired waters and preparation of the §303(d) list:

The Arizona Legislature enacted laws governing ADEQ's development of the §303(d) list in 2000. A.R.S. § 49-232(B) requires that ADEQ consider only "reasonably current, credible and scientifically defensible" data that ADEQ has collected or received from another source in determining whether a water body is an impaired water. The results of water sampling or other assessments of water quality are considered credible and scientifically defensible data only if ADEQ has determined:

1. Appropriate quality assurance and quality control procedures were followed and documented in collecting and analyzing the data;
2. The samples or analyses are representative of water quality conditions at the time the data was collected;
3. The data consists of an adequate number of samples based on the water body in question and the parameters being analyzed; and
4. The method of sampling and analysis, including analytical, statistical and modeling methods, is generally accepted and validated in the scientific community as appropriate for use in assessing the condition of the water.

ADEQ considered reasonable current, credible and scientifically defensible data in preparing the 2006/2008 draft §303(d) list. The water quality data and information that ADEQ considered are summarized in *2006/2008 Status of Ambient Surface Water Quality in Arizona – Arizona's Integrated 305(b) Assessment and 303(d) Listing Report* (Draft February 2007) (the "Integrated Report").

ADEQ is required by A.R.S. § 49-232(C) to adopt, by rule, the methodology to be used in identifying waters as impaired. These rules must specify the following:

1. Minimum data requirements and quality assurance and quality control requirements consistent with the requirements of A.R.S. § 49-232(B)(1-4).
2. Appropriate sampling, analytical and scientific techniques that may be used in assessing whether a water is impaired.
3. Any statistical or modeling techniques that ADEQ uses to assess or interpret data.
4. Criteria for including and removing waters from the list of impaired waters, including any implementation procedures used for identifying impaired waters on the basis of exceedances of narrative water quality standards.

ADEQ prepared the 2006/2008 §303(d) list in accordance with its Impaired Water Identification Rules [IWIR] that ADEQ adopted in 2002 [*see* A.A.C. R18-11-601 through R18-11-606]. In addition, ADEQ prepared a guidance document that provides additional information on the assessment methods ADEQ uses to identify impaired waters. This

guidance document is titled *Surface Water Assessment Methods and Technical Support* (Draft February 2007) (ADEQ Publication Number EQR-07-02).

Under A.R.S. § 49-232(D), ADEQ must consider available data in light of the nature of each water body being assessed (including whether a water body is an ephemeral water) when determining whether to include a water body on the §303(d) list of impaired waters. None of the new listings of impaired waters by ADEQ in 2006/2008 are ephemeral waters.

ADEQ is prohibited by A.R.S. § 49-232(F) from listing a water body as an impaired water based on a violation of a narrative or biological water quality standard prior to adopting implementation procedures identifying the objective bases for determining that a violation of the standard exists. None of the waters identified by ADEQ on the 2006/2008 §303(d) list are listed because of violations of narrative or biological water quality standards.

6. Total Maximum Daily Load (TMDL) prioritization and schedule

The Department is required by A.R.S. § 49-233(A) to develop a priority ranking and a schedule for TMDL development for impaired waters identified on the §303(d) list. ADEQ developed this priority ranking taking into account the factors listed in A.R.S. § 49-233(C) and A.A.C. R18-11-606. In general, ADEQ considers an impaired water to be a high priority for TMDL development when the pollutant of concern poses a substantial threat to the health and safety of humans, aquatic life or wildlife. High priority waters are targeted for TMDL development within the two years following EPA approval of the §303(d) list, unless specific low priority factors also are identified. A table containing ADEQ's 2006 TMDL Prioritization and Schedule is included in this notice. ADEQ has included a second table containing a priority ranking and schedule for TMDL development for impaired waters that were added to the §303(d) list by EPA in previous assessment cycles. ADEQ priority rankings and schedules for TMDL development are provided for public information purposes only. Neither a priority ranking nor the proposed schedule for TMDL development is an appealable agency action. Similar to the separate 303(d) List for EPA identified impaired waters, ADEQ has prepared a separate prioritization table for the EPA 303(d) listings. The prioritization is the same as EPA identified with the original listing in 2002 or 2004.

7. ADEQ response to comments on draft §303(d) list

Arizona's draft of *The Status of Water Quality in Arizona – 2006/2008 Arizona's Integrated 305(b) and 303(d) Listing Report* was given public review from March 1, 2007 through March 30, 2007. Comments received by ADEQ are grouped by the commenter and issue below. ADEQ responses to public comments relating to impaired waters on the §303(d) list are provided in this notice of public information.

Comments from the Environmental Protection Agency

EPA Comment 1: The state did not retain on the 2006 §303(d) list the waters and pollutants added to the list by EPA in 2002 and 2004. The draft report does not provide adequate explanation regarding the state's decision to omit these previously listed waters. The state is obligated to provide good cause for de-listing waters that were previously included on the 2004 §303(d) list [*see* 40 CFR 130.7(b)(6)].

ADEQ Response 1: ADEQ is not de-listing waters and pollutants that were added to the §303(d) list by EPA in 2002 and 2004. ADEQ is providing a *separate* portion of the Arizona §303(d) list showing EPA additions in previous assessment cycles. ADEQ is distinguishing the EPA listings because they do not meet the requirements of A.R.S. § 49-232 or state listing criteria established in ADEQ's Impaired Water Identification Rules [*see Arizona Administrative Code* (A.A.C.) R18-11-601 through R18-11-606]. ADEQ is prohibited by Arizona law from including these waters on ADEQ's portion of the §303(d) list. ADEQ can only de-list waters on its portion of Arizona's §303(d) list. EPA should review their previous listings to determine which waters will remain on EPA's portion of the §303(d) list. ADEQ will incorporate any EPA adjustments to the EPA §303(d) list in the final 2006/2008 Integrated Report.

EPA Comment 2: Within the assessment summaries of individual waters (in the 2006 Integrated Report), language in the footnotes mistakenly implies that there are two separate §303(d) lists; the state's list based on its methodology and EPA's list based on its methodology. The final 2004 §303(d) list, approved by EPA on March 17, 2005, includes both agencies' determinations of impaired waters in Category 5.

ADEQ Response 2: There is one Arizona §303(d) list of impaired waters. However, Arizona's §303(d) list is divided into two parts to distinguish EPA identifications of impaired waters made under federal assessment and listing criteria from ADEQ identifications made under A.R.S. § 49-232 and the Impaired Water Identification Rules.

EPA Comment 3: EPA understands the state's view that state law bars the Department from applying narrative water quality standards for assessment purposes absent adopted implementation procedures. Federal regulations require the assessment of whether waters are attaining all applicable standards, including narrative standards [40 CFR 130.7(b)(3)]. If the state is unable to evaluate potential exceedances of narrative standards (e.g., in cases where consumption advisories are in effect or where sediment, fish tissue, or biological data and information indicate that narrative standards are not attained), then EPA will conduct its own evaluation and, if necessary, add waters to Arizona's §303(d) list due to narrative standards violations.

ADEQ Response 3: ADEQ appreciates EPA's understanding that Arizona law bars ADEQ from using a narrative water quality standard for §303(d) listing purposes in the absence of specific implementation procedures for that narrative standard. Under A.R.S. § 49-232(F), ADEQ is prohibited from listing a surface water on the §303(d) list based on a violation of a narrative water quality standard before adopting implementation procedures that specifically identify the objective basis for determining that a violation of the narrative standard exists. ADEQ agrees that EPA has

independent authority to conduct its own evaluation of impaired waters in Arizona, as well as authority to approve or disapprove portions of Arizona's §303(d) list. EPA may add waters to Arizona's §303(d) list due to narrative standards violations. If EPA does so, ADEQ would add them to that portion of the §303(d) list containing impaired waters identified by EPA. ADEQ is preparing several sets of implementation procedures for narrative water quality standards for adoption through the ongoing triennial review process.

EPA Comment 4: In its decision on the 2004 list, EPA found that the state had not provided a valid technical rationale in support of its use of minimum sample size requirements as a precondition for assessing attainment of most water quality standards (*See* EPA's decision letter dated November 16, 2004). EPA disapproved the state's decision not to list several waters because EPA found that sufficient data were available to support clear conclusions that applicable numeric water quality standards were exceeded. EPA added several surface waters and pollutants to the state's final 2004 §303(d) list. We repeat our concern that the state's proposed application of minimum sample size requirements is inconsistent with federal listing requirements. We understand that the Department's ability to change its listing methodology is limited due to state regulatory provisions; however, EPA will carefully review situations where waters were not listed due to minimum sample size considerations.

ADEQ Response 4: Minimum sample size requirements are prescribed in the Impaired Water Identification rules. Changes in ADEQ's listing methodology must be made through the state rulemaking process. ADEQ is still in the process of making these changes.

EPA Comment 5: The proposed listing decisions appear to incorporate a revised procedure for assessing compliance with chronic water quality standards for toxicants. It appears that the proposed assessment methodology is inconsistent with the state standard for chronic toxicants and with federal listing guidance (*Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* (EPA, July 29, 2005). The draft report provides no rationale to support the proposed methodology that considers the entire assessment period. EPA strongly recommends that the state revise its assessment methodology for chronic toxicants (and associated assessment decisions) to be consistent with the applicable standards and with federal assessment guidance. Based on EPA's preliminary analysis of the draft report, we have identified several waters and pollutants that may exceed the applicable chronic water quality standards.

ADEQ Response 5: ADEQ used the same procedure for listing impaired waters based on exceedances of chronic water quality standards in 2006 that it used in 2004. In 2004, ADEQ included water bodies on the §303(d) list of impaired waters where there were two or more exceedances of chronic water quality standards within the assessment period. ADEQ is considering changes to its Impaired Waters Identification Rule and assessment methodology guidance document to clarify the frequency of exceedances of chronic criteria to be more consistent with EPA's 2006 listing guidance (e.g., two or more exceedances within a three-year period).

EPA Comment 6: EPA's 2006 Integrated Report Guidance (pg. 39) clarifies that we do not recommend the application of a 10% exceedance threshold for conventional pollutants (particularly within the context of a binomial statistical test) unless the 10% rule is specifically consistent with the state water quality standards (e.g. for a standard expressed as a 90th percentile value). ADEQ needs to provide a rationale that demonstrates how its methodology is consistent with applicable water quality standards. Our preliminary review of the draft report indicates that several waters appear to exceed water quality standards in greater than 10% of available samples and would therefore appear to warrant listing as impaired for dissolved oxygen and/or pH, including Black Canyon Lake, South Fork Cave Creek, Gibson Mine tributary, Parker Canyon Lake, Roosevelt Lake and Woods Canyon Lake.

ADEQ Response 6: The 10% exceedance rate at a 90% confidence level listing methodology for conventional pollutants is established in Arizona's Impaired Water Identification Rules which were adopted in 2002. The rationale for the use of the 10% exceedance rate was explained in ADEQ's 2002 Technical Support Document which EPA found acceptable in the 2004 assessment cycle. EPA's policy on the use of the 10% rule now appears to be changing as EPA's 2006 Integrated Report Guidance presents a narrower interpretation of the appropriate use of the "10% rule." However, a "new rationale" is currently not an option for ADEQ as our 2002 IWIR is still effective. Furthermore, EPA has not issued its listing guidance in the form of a federal regulation. Arizona statutes and administrative rules take precedence over EPA recommendations made in federal guidance. ADEQ believes that the EPA guidance provides states with flexibility to tailor their listing methodologies to their own unique water quality standards, monitoring programs, and hydrologic conditions provided that a sufficient rationale is given. With regard to the specific surface waters EPA cites in this comment, ADEQ applied the binomial approach to assess attainment of numeric dissolved oxygen and pH standards. In general, ADEQ either did not have a sufficient number of samples, a sufficient number of exceedances, or both under the binomial approach to list the surface waters as impaired waters under A.A.C. R18-11-605(D)(1).

EPA Comment 7: The state proposes not to list several waters based on the natural sources exclusion. We have identified and have concerns regarding the following waters: Dankworth Ponds, Roper Lake, Beaver Creek, Granite Basin Lake, Big Sandy River and the Santa Maria River. We will need detailed documentation that any water quality standards exclusions in these waters are due solely to naturally occurring sources.

ADEQ Response 7: ADEQ will provide additional documentation to EPA supporting ADEQ's decision to list the following waters in the 4N category: Dankworth Ponds, Roper Lake and Granite Basin Lake. Upon reviewing the data for dissolved oxygen, ADEQ agrees that there is insufficient evidence to prove that low dissolved oxygen is due to naturally occurring conditions alone in Beaver Creek, Big Sandy River, and Santa Maria River. ADEQ intends to remove these waters from the 4N category in the final Integrated Report. ADEQ assessed Beaver Creek as Category

2 (attaining some uses), Big Sandy River as Category 2 (attaining some uses), and for the Santa Maria River: from Little Sycamore Creek to Little Shipp Wash, as Category 5 (impaired for mercury) and from Bridle Creek to Date Creek as Category 2 (attaining some uses).

EPA Comment 8: Federal regulations require the state to "assemble and evaluate all existing and readily available water quality-related data and information" to develop its §303(d) list [*see* 40 CFR 130.7(b)(5)]. This broad mandate addresses data and information types in addition to water column data, including (but not limited to) aquatic sediment data, tissue data, biological data, toxicity data, physical integrity data, and data and information concerning fish kills or other water quality problems. It appears that the state focused its water quality assessments solely on water column data, and it is unclear whether the state actually assembled and evaluated all existing and readily available water quality-related data and information for the 2006 assessment. If the state did not assemble all available data and information, we request that you identify available data and information sources which ADEQ did not consider to assist us in obtaining and evaluating them.

ADEQ Response 8: ADEQ reviewed available data and information related to fish tissue analysis, fish consumption advisories, and fish kills. All waters where a fish consumption advisory is in effect, or where a fish kill occurred (unless due to drought or stocking of inappropriate species) were placed on the Planning List until narrative implementation procedures are established in accordance with the Impaired Water Identification Rules. ADEQ could not evaluate sediment data, biological data, toxicity data, or physical integrity data, because no water quality standards for these parameters have yet been developed against which data could be assessed. As the Department requested in 2004, ADEQ again requests that EPA allow the Department to continue its work in establishing these criteria. ADEQ is developing implementation procedures for: 1) narrative "bottom deposit" standard, 2) narrative nutrient standard for lakes and reservoirs and 3) a narrative biocriterion for wadeable, perennial streams in the current triennial review of water quality standards. ADEQ expects to have these implementation procedures established in rule in time for use in the 2010 assessment.

EPA Comment 9: EPA requests that the Assessment Methodology document should more accurately reflect that EPA's action on the state's §303(d) submittals consists of three options: approval, disapproval or partial approval/ partial disapproval.

ADEQ Response 9: ADEQ will amend the Assessment Methods document to more accurately reflect EPA's actions on state §303(d) submittals in accordance with the three options outlined by EPA.

ASARCO, LLC

ASARCO Comment 10: ADEQ should place Mineral Creek in Category 4B rather than Category 5, defer TMDL development, and allow ASARCO to propose and implement measures pursuant to the Consent Decree that would address observed exceedances of selenium and low dissolved oxygen standards. Such an approach would be consistent with Arizona's TMDL statute at A.R.S. § 49-233(C)(14) (allowing ADEQ to consider actions under other programs in prioritizing waters for TMDL development). This approach also would be consistent with ADEQ's draft methods document, which includes category 4B (areas where alternative pollution control requirements are being used to meet standards rather than a TMDL), and EPA's 2006 TMDL guidance. ASARCO expects to propose in the near future specific measures regarding both selenium and dissolved oxygen.

ADEQ Response 10: ADEQ welcomes ASARCO's intention to mitigate these water quality problems and will place Mineral Creek in Category 4B when the required documentation to support such placement is received. The required documentation can be found in EPA's 2006 Integrated Report Guidance located at http://www.epa.gov/owow/tmdl/2006IRG/report/2006irg-report.pdf. ADEQ may not place a surface water in the 4B category until the requirements outlined in this guidance are met.

ASARCO Comment 11: Selenium may be largely or exclusively from natural mineralized rock, and therefore, Mineral Creek listing would not be appropriate pursuant to Arizona Revised Statute § 49-232(D). The statute prohibits listing where natural sources alone would be sufficient to cause an exceedance of the standard, even if there is some contribution from manmade sources present.

ADEQ Response 11: ADEQ agrees that where natural background conditions *alone* exceed water quality standards, a surface water cannot be listed as impaired under A.R.S. § 49-232(D). A TMDL investigation is generally needed to accurately determine what portion of the impairment is due to natural conditions alone versus anthropogenic activities. ASARCO's own water quality investigation indicates that selenium exceedances appear to be related to seeps *within* a man-made diversion tunnel constructed to route Mineral Creek around areas of planned mine expansion. It may be difficult to demonstrate that the elevated levels of selenium are due to natural conditions alone and not due to manmade hydrological modifications and mining activities in the area.

ASARCO Comment 12: The draft report is in error concerning Southwestern willow flycatcher critical habitat. Although the Gila River in this vicinity is included within the critical habitat for the flycatcher, Mineral Creek is not included within the critical habitat designation. ASARCO questions the factual assertion that selenium levels in Mineral Creek would threaten the Southwestern willow flycatcher and believes the language should be removed from the final report.

ADEQ Response 12: ADEQ agrees and will correct the text regarding the Southwestern willow flycatcher in Appendix C of the Integrated Report and revise the TMDL prioritization of Mineral Creek from high priority to medium priority.

ASARCO Comment 13: The low dissolved oxygen measurements are infrequent at the tunnel outlet, but slightly more frequent at the outlet of the lined channel. There has been only one low dissolved oxygen reading further downstream, near the Highway 177 Bridge since January 2000. Low dissolved oxygen levels generally occur at times of low flows. If the low dissolved oxygen measurements are not being caused by a pollutant (e.g. nutrients, COD), then listing in Category 4C rather than Category 5 is appropriate and development of a TMDL may not be needed.

ADEQ Response 13: ADEQ agrees that if the low dissolved oxygen is not due to a pollutant, Mineral Creek could be listed in Category 4C. However, ADEQ will need to provide evidence that low dissolved oxygen levels are not due to pollutants to EPA. With or without the TMDL, ADEQ is aware that ASARCO is working under a consent decree where the mining operation must meet all surface water quality standards. ADEQ anticipates working with ASARCO to determine whether a solution to the problem of low dissolved oxygen can be found in this highly modified stream, even during low flows.

ASARCO Comment 14: ASARCO would like to explore whether it would be appropriate to either modify designated uses such as "full body contact" and "aquatic and wildlife protection" for the six-mile stretch of tunnel and concrete-lined channel or develop site-specific criteria.

ADEQ Response 14: It may be appropriate to modify use designations or adopt site-specific standards for a portion of Mineral Creek. ASARCO would need to work with ADEQ to complete a Use Attainability Analysis, documenting that the use is not an existing use and it is not feasible to attain the use for one or more of the six reasons stated in *Arizona Administrative Code* R18-11-104(H). This process would require revisions to the surface water quality standards through rulemaking.

Arizona Mining Association (AMA)

AMA Comment 15: A.R.S. § 49-232(C) states that "[t]he Department shall adopt by rule the methodology to be used in identifying waters as impaired." ADEQ adopted the Impaired Water Identification Rules (IWIR) pursuant to this statutory mandate. To the extent that the draft Assessment Methods Document and the Integrated Report are inconsistent with or attempt to go beyond the IWIR, they are invalid.

ADEQ Response 15: ADEQ was careful to make both the Assessment Methods Document and the Integrated Report consistent with the Impaired Water Identification Rule. The Assessment Methods document translates formal rule language into an understandable process, describing step-by-step how assessments are completed. It also adds in the process for determining attainment of designated uses, as attainment decision criteria are not established in the rule. Further, the AMA's comments are not made with respect to any specific provision of the Assessment Methods document, the Integrated Report, or to a specific ADEQ §303(d) listing proposal.

AMA Comment 16: The use of a grab sample to represent an exceedance of chronic aquatic and wildlife criteria is contrary to EPA's 2006 assessment and listing guidance.

ADEQ Response 16: EPA guidance specifically recognizes that states may use individual grab sample results to support assessments. EPA guidance recommends that when states uses grab sample results, they should describe the decision logic the state uses to determine the temporal and spatial extent a grab sample represents. EPA also recommends that state decisions to use or not use a grab sample be based on contextual information. ADEQ used readily available contextual information for this assessment, using the weight-of-evidence rules in A.A.C. R18-11-605(B). ADEQ clearly described the logic used when determining whether an exceedance of chronic aquatic and wildlife criteria would be used to make an impairment decision at page 42-43 of the Technical Support Document.

AMA Comment 17: The use of a grab sample for assessments is in conflict with A.A.C. R18-11-120(C) for determining compliance with chronic aquatic and wildlife criteria. EPA's 2006 listing guidance provides that a state's assessment methods must be consistent with EPA-approved surface water quality standards. The standards provide, in pertinent part, that "[c]ompliance with chronic aquatic and wildlife criteria shall be determined from the geometric mean of the analytical results of the last four samples taken at least 24 hours apart." This language is clear on its face. In order to determine compliance with applicable chronic aquatic and wildlife criteria under any context, Arizona's surface water quality standards require the calculation of the geometric mean from the last four samples taken at least 24 hours apart.

ADEQ Response 17: A.A.C. R18-11-120 is entitled "Enforcement" and establishes criteria ADEQ will use to determine compliance and take enforcement action for violations of water quality standards. The rule does <u>not</u> apply to §305(b) water quality assessments or to §303(d) listings of impaired waters. ADEQ adopted a different set of rules, the Impaired Water Identification Rules (R18-11-601 through R18-11-606), which establish how water quality standards are to be used for making §303(d) listing decisions. R18-11-605(D)(2)(b) establishes that "*more than one exceedance of … aquatic and wildlife chronic water quality standard*" will result in listing as an impaired water.

AMA Comment 18: The preamble language to Arizona's surface water quality standards clearly expresses ADEQ's intent that the compliance language for chronic aquatic and wildlife criteria in R18-11-120(C) would apply to assessments of standards under the federal Clean Water Act's §303(d) program.

ADEQ Response 18: The plain language of R18-11-120 and the 2002 preamble related to the amendment of R18-11-120 indicate that ADEQ did <u>not</u> intend R18-11-120(C) to be used for §305(b) water quality assessment and §303(d) listing purposes. The purpose of R18-11-120 is expressed in the title of the rule: "Enforcement." Nothing in the language of R18-11-120 refers to §305(b) water quality assessments or to §303(d) listing of impaired waters. This con-

clusion is further supported by the fact that ADEQ adopted a completely different set of rules, the Impaired Waters Identification rules, which address the use of water quality standards for assessment and §303(d) listing purposes.

The AMA quotes language from a preamble ADEQ wrote in 2002 to explain amendments to R18-11-120(C) and argues that the preamble supports AMA's position that ADEQ intended to use R18-11-120(C) for §305(b) water quality assessment and §303(d) listing purposes. The AMA argues that ADEQ's single use of the word, "assess," in this sentence must mean that ADEQ intended that R18-11-120(C) apply to §305(b) water quality assessments and 303(d) listings. The AMA's interpretation of ADEQ's intent with regard to R18-11-120(C) is incorrect. ADEQ used the word "assess" in the sentence quoted by the AMA as a synonym for "determine." There are at three places in the same preamble language quoted by the AMA where ADEQ uses the phrase, "determine compliance." ADEQ amended R18-11-120(C) because ADEQ had concluded that the state's chronic A&W criteria were "practically unenforceable" under the rule as previously written. That rulemaking and preamble were about the enforcement of water quality standards, not water quality assessments.

AMA Comment 19: The suggestion that a single grab sample can be presumptively used to represent chronic conditions except where there is a contextual information indicating "unstable conditions" is a misapplication of EPA listing guidance. A single grab sample may be used for chronic assessments, but only when the grab sample can be demonstrated to be representative of the average concentration of the applicable multi-day chronic sampling period. ADEQ cannot presume that chronic conditions are occurring unless contextual information indicates otherwise. This contradicts EPA guidance which provides that a state can use grab samples to represent chronic conditions but must use contextual information to decide how far out in time to extrapolate from the time the grab sample is collected. EPA's guidance only allows the use of grab sample data when contextual information demonstrates that the levels of a pollutant under study are likely to have remained fairly constant over a certain period of time. AMA respectfully requests that any reference to or use of single grab samples in the draft Surface Water Assessment Methods document and the draft Integrated Report to represent an exceedance of chronic aquatic and wildlife criteria be removed from both of the draft results.

ADEQ Response 19: ADEQ's use of grab sample results to represent exceedances of chronic aquatic and wildlife criteria and its use of contextual information is not a misapplication of EPA's 2006 assessment and listing guidance. EPA discusses the use of grab samples for assessment and listing purposes in a section entitled "Data Representativeness Considerations" in EPA's *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (July 29, 2005)* [*see* pp. 31-32]. EPA acknowledges that most states usually have relatively small amounts of data to support their §305(b) water quality assessments and will need to use all readily available data to assess water quality. EPA recognizes that states often need to extrapolate from individual points of data (i.e., from grab sample results). EPA recommends in its 2006 guidance that states describe the decision logic the state uses to determine the temporal and spatial extent a grab sample may represent. EPA also recommends that a state decision to use or not use grab samples be based on contextual information regarding conditions at the time and place the grab sample was taken.

ADEQ followed these EPA recommendations. ADEQ uses all readily available data, including grab samples results, to assess attainment of water quality standards [including A&W (chronic) standards]. ADEQ fully explains its decision logic for the use of grab samples to represent chronic exceedances on pages 42 and 43 of the *Surface Water Assessment Methods and Technical Support* document. ADEQ used contextual information to determine whether stable conditions were occurring when there were two or more exceedances of chronic A&W criteria that could be used to support a §303(d) listing.

ADEQ used contextual information to determine whether exceedances of chronic aquatic and wildlife standards occurred during stable conditions. ADEQ evaluated contextual information where there were two or more exceedances of chronic A&W standards and sufficient grounds existed for including a water body on the §303(d) list. ADEQ did not investigate contextual information where grab sample results indicated that chronic A&W standards were attained or where there was only one exceedance of a chronic A&W standard. ADEQ's use of grab sample results to assess attainment of chronic aquatic and wildlife standards and ADEQ's use of contextual information to determine whether stable conditions existed at the time of sampling is entirely consistent with EPA recommendations in EPA's *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (July 29, 2005)*. For this reason, ADEQ declines to remove references to the use of single grab samples to represent exceedances of chronic aquatic and wildlife criteria in the draft Surface Water Assessment Methods document or the draft Integrated Report.

AMA Comment 20: The use of grab samples, rather than a mean of geometric mean of samples, is in conflict with the Impaired Water Identification Rule and in conflict with the rule's preamble language that states that ADEQ would use a four-day mean to determine impairment.

ADEQ Response 20: *See* Responses #17 and #18.

AMA Comment 21: The AMA included several comments describing potential regulatory options for ADEQ to consider when water quality standards cannot be feasibly obtained, including site-specific standards development, use attainability analyses, variances, the application of alternative modeling procedures, and the use of alternative interpretations of the magnitude, duration and frequency of exceedances of water quality standards. The AMA requested that ADEQ expand the discussion of these options in its Assessment Methods Document.

ADEQ Response 21: The establishment of site-specific standards, UAAs, or other options is beyond the scope of §305(b) assessment methods document. It is more appropriate to discuss these issues within the triennial review of

water quality standards process or in the impaired waters identification rules. ADEQ will remove the referenced sentences on page 5 of the Assessment Methods document.

Freeport-McMoRan Copper and Gold Limited (FCX) (formerly Phelps Dodge Corporation)

FCX Comment 22: FCX shares the AMA's concern that ADEQ cannot use individual grab sample to represent chronic aquatic and wildlife conditions because A.A.C. R18-11-120(C) requires that compliance or assessments require a geometric mean of the analytical results of the last four samples taken at least 24 hours apart. Also, EPA requires the state to apply this minimum sample size for assessments because it was adopted into surface water quality standards. FCX requests that ADEQ drop all exceedances and listings that are based on application of chronic aquatic and wildlife criteria to individual grab samples and that corrections be made to the individual assessment reports, summary text, and appendices. FCX cited many examples (e.g., assessments on Boulder Creek, Alamo Lake, Santa Maria River, and Mule Gulch).

ADEQ Response 22: *See* ADEQ Responses #19 and #20 for ADEQ's response to the issue of the use of grab sample results to represent chronic A&W conditions. *See* ADEQ Responses #17 and #18 for the ADEQ's response to comments related to the applicability of R18-11-120(C) to the assessment process.

FCX Comment 23: FCX continues to question the appropriateness of assessing or listing ephemeral waters in Arizona due to issues of jurisdiction raised under the U.S. Supreme Court decisions in *Rapanos* v. *United States (2006)* and technical concerns regarding assessments. One technical concern is whether Arizona's current surface water quality standards are appropriate because of episodic storm water influence on water quality. Specifically, Mule Gulch and its tributaries do not qualify as "navigable waters" or "waters of the United States" and therefore cannot be assessed as "impaired" under Arizona's TMDL statute § 49-232. Mule Gulch is an isolated water that does not directly discharge to another water because its terminus appears to fan out into the desert. At most, it may be a disconnected tributary to ephemeral Whitewater Draw, which flows into Mexico. FCX does not believe that Mule Gulch would qualify as a "water of the United States" under U.S. Supreme Court decisions in *Rapanos* (2006) or *SWANCC* (2001).

ADEQ Response 23: ADEQ considers Mule Gulch and Whitewater Draw to be Waters of the U.S. under 18 A.A.C. Chapter 11, Article 1. Both are listed in Appendix B of the surface water quality standards rules which have been approved by EPA. Mule Gulch is tributary to Whitewater Draw which, as the commentor notes, does flow to Mexico which makes it an interstate water. Before reaching the international border, Whitewater Draw joins Greenbush Draw which flows in a northwesterly direction and is tributary of the San Pedro River. Both effluent dependent waters and ephemeral waters are included in Arizona's definition of "surface water" [*see* A.A.C. R18-11-101(43)] and ADEQ has adopted surface water quality standards specifically for these designated uses. Therefore, ADEQ has a duty under §305(b) of the Clean Water Act to assess the attainment of the applicable water quality standards in Mule Gulch and its tributaries based on readily available monitoring data.

FCX Comment 24: If ephemeral waters are listed as impaired, development of a TMDL should be a low priority.

ADEQ Response 24: The development of a TMDL on an ephemeral water would be assigned a low priority unless high priority factors established in A.A.C 18-11-606(B)(1) are cited, such as the pollutant of concern poses a threat to health and safety of humans, aquatic life, or wildlife using the water, or the pollutant is contributing to the impairment of a downstream perennial surface water.

FCX Comment 25: In Chapter III (summary information), the information in the table of fish consumption advisories indicates that the probable sources of mercury in Alamo Lake include mining and atmospheric deposition. This is inconsistent with the draft TMDL which documents that natural watershed sources of mercury appear to contribute virtually the entire load of mercury to Alamo Lake. Similarly the table should indicate that natural background sources of mercury represent the largest source of mercury at Coors Lake, as no mining-related sources appear to be in that drainage.

ADEQ Response 25: The summary information in Chapter III related to probable sources of mercury in Alamo Lake is not inconsistent with draft mercury TMDL for Alamo Lake. The draft TMDL calculates mercury loading at the three active USGS gages located within the Alamo Lake watershed. The mercury loads at these sites include natural background, atmospheric deposition, and local anthropogenic sources. Sampling results below historic mining operations show increased mercury concentrations in sediment and in the water column in relation to areas with no prior mining activities. ADEQ agrees that there is a natural background component to the loads causing fish tissue criteria exceedances in Alamo Lake. However, differentiating natural from anthropogenic concentrations is difficult. ADEQ continues to review current mercury deposition research and mercury TMDL development. ADEQ does not agree that the draft Alamo Lake TMDL demonstrates that "virtually the entire load" comes from natural sources. Data collection on pending mercury TMDLs will determine pollutant sources.

Coors Lake has not been characterized sufficiently to determine what the significant sources of loading include. Based upon other mercury studies conducted in Arizona and across the country it is reasonable to assume that the probable sources include natural background, atmospheric deposition, and anthropogenic sources.

FCX Comment 26: The Section on "Mercury Impairments and Potential Sources" in Chapter III, Summary Information on p. 9 of the Integrated Report suggests that ADEQ is currently developing a number of mercury TMDLs for lakes. FCX is concerned with ADEQ's overall approach to developing mercury TMDLs for the reasons listed below. FCX believes that ADEQ should defer further development of mercury TMDLs until anticipated EPA guidance on

mercury TMDLs is finalized and after holding stakeholder meetings in Arizona specific to the development of mercury TMDLs. FCX believes ADEQ should defer further work on pending mercury TMDLs for the following reasons:

1) Mercury poses complex issues with respect to the nature of its sources, impacts of sources on water quality and fish tissue levels, and the ability of science to determine how and when mercury water quality standards can be attained. Current scientific knowledge is insufficient to accurately establish the relationship of total mercury and methylmercury in the water column. ADEQ should proceed cautiously with its development of mercury TMDLs;

2) Water quality standards are the benchmark for establishing whether a water body is impaired. If the standards are flawed, all subsequent steps in the TMDL process will be affected. Accordingly, an appropriate water quality standard must be defined *before* a TMDL is developed. FCX understands that most mercury impairments are based on fish advisories using a fish tissue target that has not been adopted into Arizona's surface water quality standards. This approach violates the requirement to adopt standards through normal and appropriate administrative procedural safeguards;

3) A.R.S § 49-234(C)(2) requires that each TMDL "[b]e established at a level that will achieve and maintain compliance with applicable surface water quality standards." ADEQ cannot do a TMDL where it cannot reasonably predict that the standard can be attained;

4) Most of the mercury impairment listings in Arizona have occurred via over-filings by EPA on ADEQ's §303(d) lists. These actions circumvent A.R.S § 49-232(E) because no determination has been made that the state's EPA-approved numeric standards for mercury were inadequate. They also circumvent A.R.S. § 49-232(F) because no implementation procedures have been developed to identify the objective basis for determining that a violation of the narrative standard actually exists; and

5) EPA is in the process of issuing new mercury TMDL guidance which may allow a state-wide approach to mercury that would address mercury issues more effectively than piecemeal TMDLs that may not address the true source of mercury impairments.

ADEQ Response 26: ADEQ will continue development of mercury TMDLs because mercury contamination in fish tissue poses a significant threat to human health. As a human health concern, mercury impairments based on fish tissue concentrations rank as a high priority based upon A.R.S. § 49-233 and the Impaired Waters Identification Rule.

1) ADEQ agrees that mercury TMDLs present complex scientific issues (e.g., mercury speciation, bioaccumulation, and source identification). The relationship between mercury and methylmercury levels in the water column and methylmercury levels in fish tissue is well established scientifically. Further, ADEQ has conducted studies to support mercury TMDL development include determining local wet and dry atmospheric deposition rates, watershed investigations to identify potential mercury sources, data collection to support the calculation of field-based bioaccumulation factors, and extensive water quality, fish tissue, and sediment analyses using the most sensitive analytical methods (e.g. EPA Method 1631) with the lowest available method detection levels.

2) ADEQ disagrees that state adoption of the proposed methylmercury fish tissue criterion through the formal rulemaking process is a necessary precondition to ADEQ initiating data collection to support development of a mercury TMDL. ADEQ agrees with FCX that the proposed fish tissue criterion, when it becomes effective, will provide the appropriate benchmark for calculation of the maximum amount of mercury that a water body can receive and still meet the fish tissue standard. It also will provide the basis for the allocation of mercury loads from contributing point and non-point sources of mercury.

3) ADEQ disagrees with FCX's suggestion that ADEQ cannot reasonably predict that a state-adopted fish tissue criterion will be attained in a mercury TMDL. Modeling tools are available that can link together atmospheric deposition, watershed loading, and mercury cycling with bioaccumulation.

4) FCX is correct that current mercury impairments of Arizona lakes and reservoirs result from EPA over filings. EPA listed these lakes using *federal* assessment and §303(d) listing criteria. EPA is not bound by A.R.S. 49-232(E) or (F). ADEQ has proposed adopted fish tissue criterion in the ongoing SWQS rulemaking.

5) ADEQ assumes FCX is referencing EPA's proposed "5M" listing category for waters impaired by mercury. ADEQ agrees that a statewide mercury approach may be appropriate and continues to explore the possibility but does not agree that all mercury TMDL development should cease while we investigate that option.

FCX Comment 27: FCX disagrees with the suggestion that all waters in Category 4 and Category 5 are impaired, "including waters that are solely impaired due to natural conditions," and that such waters are protected under Arizona's antidegradation rule as Tier 1 waters. Arizona's TMDL Statute [A.R.S. § 49-232(D)] specifically provides that a surface water in which pollutant loadings from naturally occurring conditions alone are sufficient to cause a violation of applicable surface water quality standards *shall not be listed as impaired*. If pollutant loadings from naturally occurring conditions alone are sufficient to cause a violation of applicable standards, this suggests that the standards or designated uses may not be attainable and need to be amended through site-specific standards, a UAA, or other appropriate alternatives. FCX opposes the proposal to identify waters impaired solely due to natural conditions and the establishment of Category 4N for the same reasons.

ADEQ Response 27: ADEQ agrees that, based on A.R.S. § 49-232(D), waters that do not meet water quality standards due solely to naturally-occurring conditions cannot be listed as impaired waters in Category 5 and should not be identified as "impaired waters" in Category 4. ADEQ will revise the table in Appendix B, Category 4N and the discussion in Chapter IV relating to "Impaired Waters – Now What?" to indicate that waters in Category 4N are "not attaining" water quality standards. This nomenclature is consistent with how other waters in Category 4 are identified and distinguishes "non-attaining" waters in Category 4 from "impaired waters" in Category 5.

A surface water in which pollutant loadings from naturally occurring conditions alone are sufficient to cause a violation of applicable water quality standards is protected as a Tier 1 water under R18-11-107, the state's antidegradation rule. All surface waters, including those in Category 4N, are protected by Arizona's antidegradation rule. ADEQ considers surface waters in Category 4N to be "Tier 1" waters because the antidegradation rule states in relevant part at R18-11-107(B): "No degradation of existing water quality is permitted in a surface water *where the existing water quality does not meet the applicable water quality standard*." [Emphasis added]. Surface waters in Category 4N are water bodies where existing water quality does not meet an applicable water quality standard because of naturally-occurring conditions. For this reason, Category 4N waters are appropriately categorized as "Tier 1" waters under the antidegradation rule.

FCX Comment 28: Arizona's TMDL statute [A.R.S § 49-232(D)] provides that a surface water would be delisted not only when natural background is the *sole* source of impairment, but also when natural background alone is sufficient to cause a violation of applicable surface water quality standards. FCX requests that ADEQ amend the draft Integrated Report to clarify this interpretation of the Arizona's TMDL statute.

ADEQ Response 28: ADEQ will ensure that the language used in Chapter IV, page 1, of the Integrated Report is consistent with A.R.S. § 49-232(D). ADEQ agrees with FCX that where the natural background conditions *alone* are sufficient to cause a violation of applicable water quality standards, a surface water cannot be listed as an impaired water [*see* A.R.S. § 49-232(D)].

FCX Comment 29: ADEQ states in its discussion of Total Maximum Daily Load Analyses (Chapter IV, Action Plan, p.1) that if natural background sources would cause the water quality criterion to be exceeded, although there are other pollutant sources, a site-specific standard must be developed before loadings can be calculated. While FCX agrees with this statement, FCX requests that the language be expanded to include other potential options to such circumstances (e.g., use attainability analysis (UAA), variance, alternative modeling procedures, alternative determinations of the magnitude, duration, and frequency of exceedances needed to find a violation of the applicable water quality standard).

ADEQ Response 29: Site-specific standards, UAAs, variances, and alternative determinations of the magnitude, duration, and frequency of exceedances needed to find a violation of applicable water quality standards are more appropriately addressed in either the surface water quality standards or the impaired waters identification rulemakings. ADEQ prefers not to expand the discussion of potential options in the cited section of the Integrated Report for the same reasons stated in ADEQ Response #21.

FCX Comment 30: The segment descriptions for Boulder Creek and the pollutants impairing water quality in the first bullet on p. BW-3 of the Integrated Report should be revised as follows: "Boulder Creek, from Wilder Creek to Butte ~~Copper~~ Creek, near Bagdad is impaired due to arsenic, ~~beryllium~~, copper, manganese, ~~mercury~~, zinc, and low pH. Boulder Creek, from Butte Creek to Copper Creek, is impaired due to arsenic." The proposed beryllium listing is based on single grab samples presumptively representing chronic exceedances and should be removed. Additionally, the draft Integrated Report does not propose to list Boulder Creek, from Wilder Creek to Butte Creek as impaired for mercury. Additionally, the current listings for copper and zinc and proposed new listings for manganese and low pH apply to Boulder Creek from Wilder Creek to Butte Creek.

ADEQ Response 30: ADEQ will revise the reach descriptions of Boulder Creek in the first bullet as recommended by FCX to distinguish the Wilder Creek to Butte Creek and Butte Creek to Copper Creek reaches of Boulder Creek. ADEQ will remove the word, "impaired," and replace it with "not attaining water quality standards." ADEQ assessed both of the referenced reaches of Boulder Creek and place them in either Category 4A (*not attaining* water quality standards; TMDL completed and being implemented) or Category 4B (not attaining water quality standards; alternative pollution control requirements implemented). "Impaired water" is an assessment term of art that is synonymous with a Category 5 water. ADEQ did not list Boulder Creek as an impaired water (i.e., as a Category 5 water) for beryllium or mercury on the draft §303(d) list.

FCX Comment 31: ADEQ should revise the second bullet on p. BW-3 of the Integrated Report to remove the suggestion that mercury contamination is impairing two reaches of Boulder Creek. The more specific discussion of each Boulder Creek segment in the report does not support this conclusion.

ADEQ Response 31: ADEQ agrees and will revise the text in the second bullet on p. BW-3 of the Integrated Report to remove the specific reference to mercury impairment of "two reaches of Boulder Creek." In the Integrated Report, ADEQ assessed the referenced reaches of Boulder Creek as either "attaining" mercury standards or "inconclusive."

FCX Comment 32: FCX requests the reference to mercury impairment associated with two segments of the Santa Maria River be removed from the second bullet on p. BW-3 of the Integrated Report because the proposed listings are based improperly on the use of single grab samples to indicate exceedances of the chronic mercury criterion.

ADEQ Response 32: The use of grab samples is allowed under the IWIR and federal guidance. ADEQ is proposing to list the Santa Maria River from Little Sycamore Creek to Little Shipp Wash as an impaired water for mercury (*see*

pages BW-33 and BW-35 of the Integrated Report) based on exceedances in samples taken using ultra-clean sampling techniques. For the reach from Little Sycamore Creek to Little Shipp Wash, there were two exceedances in five ultra-clean samples; this meets the requirements for impairment under R18-11-605(D). ADEQ agrees, based on weight of evidence, that the Santa Maria segment from Bridle Creek to Date Creek requires additional analysis and has been removed from the impaired waters list (Category 5) and placed in Category 2 as attaining some uses.

FCX Comment 33: The column indicating "impairment status" on pp. BW-7 and BW-8 of the Integrated Report should be revised for the potential EPA listing of Alamo Lake. The column currently states that a mercury TMDL for Alamo Lake should be completed in 2006. This obviously is inaccurate since the Alamo Lake TMDL is still in draft form.

ADEQ Response 33: ADEQ will correct the proposed completion date for the Alamo Lake TMDL and change it from 2006 to 2008.

FCX Comment 34: The exceedances table for Alamo Lake on pp. BW-7 and BW-8 of the Integrated Report is inaccurate and should be revised to the extent that it suggests that the attainment status of Alamo Lake is inconclusive for the chronic mercury criterion because there has been one exceedance of the chronic A&W criterion for mercury during the assessment period. The alleged exceedance appears to be based on a single grab sample. As discussed [in previous FCX comments] one exceedance of the chronic aquatic and wildlife criteria cannot be based on a single grab sample, rather it must be based on the geometric mean of the results of the last four samples taken at least 24 hours apart [*see* A.A.C. R18-11-120(C)]. Additionally, there is no discussion or documentation on whether the sample was taken during stable conditions. Without such documentation, grab samples, even under EPA guidance cannot be presumed to represent chronic conditions. This same comment regarding the presumptive use of a single grab sample to represent chronic aquatic and wildlife criterion exceedances applies to each instance throughout the draft Integrated Report where ADEQ implies that in any way that a single grab sample can be used or presumed to represent an exceedance of chronic aquatic and wildlife criterion or is representative of chronic conditions in the absence of specific documentation that the sample was taken during stable conditions.

ADEQ Response 34: The weight of evidence supports ADEQ's assessment of "inconclusive" for Alamo Lake. First, the single grab sample result is evidence that the numeric A&Ww (chronic) criterion for dissolved mercury was exceeded at least once during the assessment period. Based on the ADEQ's assessment methodology, ADEQ cannot categorize Alamo Lake as "attaining" given the existence of one sample result which exceeded the chronic criterion. Second, EPA listed Alamo Lake as an impaired water in 2004 because of a fish consumption advisory for mercury. Third, ADEQ is proposing to list a segment of the Santa Maria River, a tributary to Alamo Lake, as an impaired water for mercury. Finally, ADEQ disagrees with FCX that exceedances for chronic criteria must be based on the geometric mean as prescribed by R18-11-120(C). R18-11-120(C) does not apply to §305(b) water quality assessment purposes (*see* ADEQ Responses #17 and #18).

FCX Comment 35: The "Data Gaps and Monitoring Needs" table on p. BW-8 of the Integrated Report is inaccurate and should be revised in several respects, primarily relating to the discussion of potential mercury impairment. FCX strongly opposes the suggestion that there is potential mercury impairment when Arizona's TMDL statute [*see* A.R.S. § 49-232(F)] clearly states that until implementation procedures for narrative standards are adopted, waters cannot be listed as impaired based on an alleged violation of narrative standards. [A]lthough ADEQ states that it cannot list Alamo Lake as impaired for a violation of narrative standards because of statutory constraints, it is inappropriate to opine on the potential impairment status of Alamo Lake in the absence of the statutory requirements before even considering a listing. We also object to statement that "several tributaries in the watershed have exceedances of mercury standards." This is inaccurate because we expect that none of the alleged exceedances is in accordance with Arizona's surface water quality standards [*See* AA.C. R18-11-120(C)] and are based on single grab samples presumptively representing exceedances of the chronic criterion. ADEQ also states that the "Santa Maria River…is listed as impaired due to mercury." We understand that this is a proposed listing and that the Santa Maria is not on the 2004 303(d) list.

ADEQ Response 35: It is appropriate to discuss potential mercury impairment of Alamo Lake in the "Data Gaps and Monitoring Needs" table on p. BW-8 of the Integrated Report because EPA listed Alamo Lake as an impaired water due to mercury in fish tissue in 2004. A.R.S. § 49-232(F) prohibits ADEQ from *listing* Alamo Lake as impaired water on the §303(d) list on grounds of a narrative standards violation in the absence of implementation procedures which specify the objective basis for determining that a violation exists. ADEQ is <u>not</u> proposing to list Alamo Lake as an impaired water based on a violation of a narrative water quality standard. The statement, in the data gaps section of the Integrated Report, that several tributaries in the Alamo Lake watershed have exceedances of mercury standards is factually accurate and needs no revision. ADEQ does not agree with FCX that R18-11-120(C) applies to determining exceedances for assessment and listing purposes [*see* ADEQ Responses # 17 and #18]. Finally, ADEQ will revise the text to state that ADEQ is proposing to list a reach of the Santa Maria River as impaired for mercury.

FCX Comment 36: The mercury impairment discussion in the Data Gaps and Monitoring Needs table on page BW-16 of the Integrated Report for Boulder Creek (unnamed tributary to Wilder Creek) is inaccurate and should be revised in several respects. First, the statement that there was an exceedance of the chronic mercury criterion based on a single grab sample should be removed for reasons set forth by FCX in previous comments. Second, FCX strongly opposes the suggestion that there is evidence of potential mercury impairment given the sets of four-day mercury samples collected by Phelps Dodge Bagdad in this segment which indicated no issue with mercury. FCX believes that the segment should be designated as "attaining" for the chronic mercury criterion.

ADEQ Response 36: ADEQ cannot assess the referenced reach of Boulder Creek as "attaining" under our current assessment methods because there was one exceedance of the chronic A&Ww for mercury within the assessment period. Under ADEQ's impaired water identification rules, R18-11-604(D)(2), ADEQ is required to place Boulder Creek on the planning list, in this case Category 2, for additional review and evaluation to determine if the segment is impaired. Finally, ADEQ's current Assessment Methods document states that there cannot be any exceedances of the chronic A&Ww criterion for mercury for ADEQ to make a finding of "attaining" [*see* "Assessment Criteria Summary Table" in *Surface Water Assessment Methods and Technical Support*," (Draft February 2007, Publication Number EQR-07-02, p. 26). Also, *see* responses to #17, #18, and #19.]

FCX Comment 37: The "Exceedances" table for Boulder Creek (from unnamed tributary to Wilder Creek) on pages BW-15 and BW-16 of the Integrated Report is inaccurate and should be revised. It suggests that the attainment status for Boulder Creek is inconclusive for the chronic mercury criterion under the A&Ww designated use because there has been one exceedance during the assessment period. The alleged exceedance is based on a single grab sample. One exceedance of the chronic A&W criteria cannot be based or presumed on a single grab sample. Rather, it must be based on the geometric mean of the results of the last four samples taken at least 24 hours apart [*see* A.A.C. R18-11-120(C)]. Additionally, there is no documentation on whether the sample was taken during stable conditions. Without such documentation, grab samples, cannot be presumed to represent chronic conditions under any circumstances.

ADEQ Response 37: *See* Response #36.

FCX Comment 38: The "Exceedances" table for Boulder Creek (from Wilder Creek to Butte Creek) on pages BW-17 and BW-18 of the Integrated Report is inaccurate and should be revised. It suggests that the attainment status for Boulder Creek is inconclusive for the chronic mercury criterion under the A&Ww designated use because there has been one exceedance during the assessment period, and the attainment status is impaired for the chronic beryllium and copper criterion under the A&Ww designated use. The alleged exceedances are based on single grab samples and are therefore invalid. Additionally, there is no documentation on whether the single grab samples were taken during stable conditions. Without such documentation, grab samples, cannot be presumed to represent chronic conditions under any circumstances.

ADEQ Response 38: *See* Response #17, #18, #19 and #36. ADEQ's assessment that Boulder Creek is impaired for beryllium and copper is based on water quality data showing seven exceedances of the numeric A&Ww chronic criterion for beryllium in seven sampling events and five exceedances of the copper criterion in five sampling events during the assessment period (*see* BW-18). It is important to note that ADEQ is not proposing to list Boulder Creek (from Wilder Creek to Butte Creek) on the draft §303(d) list for beryllium or copper in 2006. ADEQ is proposing to place the referenced reach of Boulder Creek in Category 4A for copper (as well as arsenic and zinc) because a TMDL to address copper impairment in Boulder Creek has been completed. ADEQ proposes to place Boulder Creek in Category 4B for beryllium, pH and manganese because TMDL implementation and remediation of the three mine tailings piles along Boulder Creek should also address exceedances of water quality standards for these parameters.

FCX Comment 39: The mercury impairment discussion in the Data Gaps and Monitoring Needs table on page BW-19 of the Integrated Report is inaccurate and should be revised in several respects. First, the statement that there was an exceedance of the chronic mercury criterion based on a single grab sample near Hillside Mine's upper tailings pile should be removed for reasons set forth by FCX in previous comments. Second, FCX strongly opposes the suggestion that there is evidence of potential mercury impairment given the sets of four-day mercury samples collected by Phelps Dodge Bagdad in this segment which indicated no issue with mercury. FCX believes that the segment should be designated as "attaining" for the chronic mercury criterion

ADEQ Response 39: *See* Response #36.

FCX Comment 40: The "Exceedances" table for Boulder Creek (from Copper Creek to Burro Creek) on Ppges BW-21 of the Integrated Report is inaccurate and should be revised. It suggests that the attainment status for Boulder Creek is inconclusive for the chronic selenium criterion under the A&Ww designated use because there has been one exceedance during the assessment period. The alleged exceedance appears to be presumed based on a single grab sample. One exceedance cannot be presumed based on a single grab sample, rather it must be based on a geometric mean of the last four samples taken at least 24 hours apart [*see* R18-11-120(C)]. Additionally, there is no documentation on whether the single grab samples were taken during stable conditions. Without such documentation, grab samples cannot be presumed to represent chronic conditions under any circumstances.

ADEQ Response 40: *See* Response #19.

FCX Comment 41: The mercury discussion in the "Data Gaps and Monitoring Needs" table for Burro Creek (from Boulder Creek to Black Canyon Creek) on p. BW-25 of the Integrated Report is inaccurate and should be deleted or substantially revised. For instance, FCX strongly opposes the suggestion that there is evidence of potential mercury impairment given the sets of four-day mercury samples collected by Phelps Dodge Bagdad in this segment which indicate compliance with the applicable chronic criterion.

ADEQ Response 41: ADEQ specifically includes a discussion of the Phelps Dodge Bagdad monitoring data in its mercury discussion on p. BW-25 of the report. Also, ADEQ acknowledges in the discussion that there were no exceedances of chronic A&Ww criteria for mercury in the Phelps Dodge Bagdad datasets. ADEQ assessed Burro Creek from Boulder Creek to Black Canyon Creek as "attaining" its A&Ww (chronic) designated uses based on the more recent Phelps Dodge Bagdad dataset. It remains inconclusive due to two exceedances of the total mercury standard for protection of the fish consumption designated use.

FCX Comment 42: The "Exceedances" table on p. BW-33 of the Integrated Report is inaccurate and should be revised to the extent that it suggests that the attainment status for the Santa Maria River (from Little Sycamore Creek to Little Shipp Wash) is impaired for the chronic mercury criterion under the A&Ww designated use because there have been two exceedances during the assessment period. The alleged exceedances were presumed entirely on the basis of two single grab samples, one collected in July 2003 and the other collected in August 2004 (both samples were collected during Arizona's monsoon season). An exceedance of the A&Ww chronic criterion cannot be based on a single grab sample, rather it must be based on a geometric mean of the last four samples taken at least 24 hours apart [*see* R18-11-120(C)]. Additionally, there is no documentation on whether the single grab samples were taken during stable conditions. Without such documentation, grab samples, cannot be presumed to represent chronic conditions under any circumstances.

ADEQ Response 42: *See* Responses #17, #18, #19, and #32. This listing of the Santa Maria (from Little Sycamore Creek to Little Shipp Wash) is based on two exceedances in five samples. ADEQ considered contextual information to determine whether four-day stable conditions were occurring when exceedances of A&W (chronic) criteria for mercury occurred in the Santa Maria River. While the notes on p. BW-33 of the Integrated Report are silent as to whether stable conditions were occurring at the time of the exceedances, it is clear from other notes in the Integrated Report that ADEQ considered contextual information when deciding whether to list the Santa Maria River as an impaired water for mercury. For example, the notes to the exceedance table on p. BW-35 of the Integrated Report for the Santa Maria River (from Bridle Creek to Date Creek) provide a specific example where ADEQ did not use a grab sample result for dissolved mercury because the sample was collected during storm flows and did not represent chronic conditions. This example shows that ADEQ used contextual information to evaluate exceedances of the A&Ww (chronic) criterion for mercury on the Santa Maria River and that it followed its published method for performing assessments based on chronic criteria as described on pp. 42-43 of its *Surface Water Assessment Methods and Technical Support* document.

FCX Comment 43: The "Exceedances" table on p. BW-35 of the Integrated Report is inaccurate and should be revised to the extent that it suggests that the attainment status for the Santa Maria River (from Bridle Creek to Date Creek) is impaired for the chronic mercury criterion under the A&Ww designated use on the alleged basis that there has been three exceedances of the criterion during the assessment period. The alleged exceedances were presumed entirely on the basis of three grab samples; one collected in July 2003, one in August 2004, and one in November 2004 (two samples were collected during Arizona's monsoon season). An exceedance of the A&Ww chronic criterion cannot be based on a single grab sample, rather it must be based on a geometric mean of the last four samples taken at least 24 hours apart [*See* R18-11-120(C)]. In fact, the circumstances of the timing of the July 2003 and August 2004 samples would suggest that such samples were taken during "unstable conditions" or at least during periods when the river was influenced primarily by storm runoff. Without such documentation of stable conditions, grab samples… cannot be presumed to represent chronic conditions under any circumstances.

ADEQ Response 43: *See* Responses #19, #20, and #32.

FCX Comment 44: FCX believes that Mule Gulch and its tributaries should be removed from the proposed §303(d) list because such waters do not qualify as "navigable waters." Arizona's TMDL statute defines "impaired water" as a "navigable water for which credible scientific data exists that satisfies the requirements of § 49-232 and that demonstrates that the water should be identified pursuant to 33 U.S.C. 1313(d) and the regulations implementing that statute. Accordingly, ADEQ does not have authority to list waters as impaired that do not meet the definition of "navigable water."

ADEQ Response 44: *See* Response #23.

FCX Comment 45: The "Exceedances" table on page SP-24 of the Integrated Report for Mule Gulch (from its headwaters to above Lavender Pit) is inaccurate and should be revised. The table suggests that the attainment status for Mule Gulch is inconclusive for the A&Ww (chronic) criterion for cadmium because there were two exceedances of the criterion during the assessment period. The alleged exceedances were presumed entirely on the basis of single grab samples and were admittedly collected during rain events. The table should be revised to show that the segment is "attaining" with respect to cadmium.

ADEQ Response 45: ADEQ is not listing the Mule Gulch reach as impaired for cadmium, but instead is assessing it as "inconclusive" because the samples were collected during a rain event (*see* San Pedro Watershed page 24). Using the weight-of evidence approach in the Impaired Water Identification Rule [R18-11-605(B)] ADEQ also considered the cadmium listing of an adjacent reach. An "attainment" assessment is not supported by the weight of evidence. The weight-of-evidence rules [*see* R18-11-605(B)] direct ADEQ to consider not only whether conditions were stable but also if such conditions are reoccurring, evidence of direct impacts on aquatic life, pollutant characteristics (relative insoluble in water or bioaccumulates), data reliability, and potential anthropogenic influences in the watershed. Finally, ADEQ may only assess Mule Gulch as "attaining" if there are no exceedances of the chronic cadmium criterion during the assessment period [*see* "Assessment Criteria Summary Table" in ADEQ's "Surface Water Assessment Methods and Technical Support" document, p. 26].

FCX Comment 46: Mule Gulch from Bisbee WWTP discharge to Highway 80 Bridge is no longer an effluent dependent water (EDW). The Bisbee WWTP discharge has been eliminated from this area since the first quarter of 2006. Consequently, the wrong standards are being applied and assessed. The assessment should be revised using the standards that apply to ephemeral aquatic and wildlife designated use.

ADEQ Response 46: The 2006/2008 assessment is based on the current water quality standards set in rule. The EDW classification of the referenced reach of Mule Gulch and the applicable surface water quality standards can only be revised through formal rulemaking. Appropriate revisions to the EDW classification of Mule Gulch from the Bisbee WWTP to the Highway 80 are underway in the ongoing Triennial Review rulemaking.

FCX Comment 47: Pinal Creek (from Lower Pinal Creek Water Treatment Plant discharge to Salt River) should not be assessed as "inconclusive" based on chronic cadmium and acute zinc exceedances when there is a large body of data showing no other exceedances.

ADEQ Response 47: The Impaired Water Identification Rule establishes that one exceedance of acute aquatic and wildlife criteria in the last three years of monitoring leads to placement on the planning list and an "inconclusive" assessment. When it comes to chronic aquatic and wildlife criteria, if there is only one exceedance during the assessment period the surface water is assessed as "inconclusive" [*see* R18-11-603(D)(2)(c)] and the water body is not attaining if one exceedance during the assessment period is found. ADEQ proposes to assess Pinal Creek as "inconclusive" because there was one exceedance of the A&Ww (chronic) criterion for cadmium during the assessment period on July 14, 2004.

FCX Comment 48: Pinal Creek does not have Agriculture Irrigation (AgI) designated use; therefore assessments need to be revised.

ADEQ Response 48: ADEQ agrees and will revise the text of the Integrated Report on pages SR-42 and SR-43 to remove references to the AgI designated use. ADEQ will revise the header to remove the reference to attainment of the AgI designated use.

FCX Comment 49: Based on the four-day mercury samples collected by Phelps Dodge Bagdad on several segments of Boulder Creek and Burro Creek, these assessment units should be assessed as "attaining" for chronic mercury criterion. Although ADEQ assesses several assessment units in the Bill Williams as "attaining" or "inconclusive" due to chronic mercury exceedances, the text and header information still indicates that they (e.g., Boulder Creek, Burro Creek, Coors Lake) are "impaired."

ADEQ Response 49: Several segments of Boulder Creek and Burro Creek were identified as impaired waters *by EPA* during previous 303(d) listing cycles. The text and header information in the individual assessments for these segments in the Integrated Report indicate ADEQ's assessments in a darker blue color. The header also provides information on EPA identifications of impaired waters based on federal assessment and listing criteria in a lighter blue color. In some cases, ADEQ may have assessed a surface water as "attaining" or "inconclusive" based on state assessment and listing criteria and EPA identified it as an impaired water using federal assessment and listing criteria. ADEQ will revise the text of the Integrated Report to clarify that there is a "bifurcated" §303(d) list which distinguishes ADEQ listings from EPA listings.

FCX Comment 50: The TMDL priority for Mule Gulch in Appendix C should be changed from high to medium priority due to the length of time necessary develop site-specific standards.

ADEQ Response 50: ADEQ agrees and will modify the priority ranking in Appendix C for Mule Gulch TMDL development from high to medium priority.

Arizona Chamber of Commerce and Industry (ACC&I)

ACC&I Comment 51: The Chamber strongly opposes ADEQ's proposal to use individual grab samples to represent chronic conditions for surface water assessment purposes. ADEQ's position is contrary to Arizona's surface water quality standards which specifically requires that assessment of compliance with chronic aquatic and wildlife criteria be determined "from the geometric mean of the analytical results of the last four samples taken at least 24 hours apart."

ADEQ Response 51: *See* Responses #17, #18, and #19.

ACC&I Comment 52: ADEQ's position also is contrary to EPA's 2006 assessment and listing guidance which provides that a state's methodology for assessing water quality attainment must be consistent with EPA-approved water quality standards. ADEQ's position is not consistent with Arizona surface water quality standards and therefore fails to follow specific EPA guidance. Further, ADEQ's position directly ignores EPA 2006 guidance that expressly conditions the potential use of a single grab sample to represent chronic conditions to a situation where there is supporting contextual information and evidence 1) indicating that the samples were taken during stable conditions, and 2) demonstrating the period of time that the single grab sample can be used as representative of water quality conditions in the sampled water segment.

ADEQ Response 52: ADEQ disagrees that its assessment methodology is inconsistent with state water quality standards or EPA's 2006 assessment and listing guidance. *See* ADEQ Responses #17, #18 and #19.

Franciscan Friars of California

Franciscan Friars Comment 53: We adopt and incorporate by reference the comments submitted by the Arizona Mining Association relating to the Methods and Technical Support component of the draft Integrated Report. We are specifically concerned with the addition of selenium as a cause of impairment to Pinto Creek (*see* page SR-46 in the Integrated Report). This determination appears to be based on three grab sample exceedances which, as explained in AMA comments, is an insufficient number of samples and an inappropriate methodology.

ADEQ Response 53: *See* Responses #18 and #19. ADEQ agrees, based on weight of evidence, that Pinto Creek (from unnamed tributary at 331927/1105456 to West Fork of Pinto Creek) requires additional analysis for selenium and has been removed from the impaired waters list (Category 5) and placed on the planning list for further monitoring.

SURFACE WATERS ASSESSED AS IMPAIRED BY ADEQ (The 2006/2008 303(d) List submittal to EPA)		
Surface Water	**Reach or Lake Number**	**Pollutants or Parameters of Concern**
Bill Williams Watershed		
Alamo Lake	15030204-0040	Ammonia, pH (high), low dissolved oxygen
Bill Williams River From Alamo Lake to Castaneda Wash	15030204-003	Ammonia, pH (high), low dissolved oxygen
Santa Maria River From Little Sycamore Creek to Little Shipp Wash	15030203-013	Mercury
Colorado - Grand Canyon Watershed		
Colorado River From Lake Powell to Paria River	14070006-001	Selenium
Colorado River From Parashant Canyon to Diamond Creek	15010002-003	Selenium, suspended sediment concentration
Paria River From Utah border to Colorado River	14070007-123	*Escherichia coli* bacteria, suspended sediment concentration
Virgin River From Beaver Dam Wash to Big Bend Wash	15010010-003	Selenium, suspended sediment concentration
Colorado – Lower Gila Watershed		
Colorado River From Hoover Dam to Lake Mohave	15030101-015	Selenium
Colorado River From Main Canal to Mexico border	15030107-001	Selenium, low dissolved oxygen
Gila River From Coyote Wash to Fortuna Wash	15070201-003	Selenium, boron
Painted Rock Borrow Pit Lake	15070201-1010	Low dissolved oxygen
Little Colorado – San Juan Watershed		
Little Colorado River From Silver Creek to Carr Wash	15020002-004	*Escherichia coli* bacteria, suspended sediment concentration
Little Colorado River From Porter Tank Draw to McDonalds Wash	15020008-017	Copper, silver, suspended sediment concentration
Middle Gila Watershed		
Alvord Park Lake	15060106B-0050	Ammonia
Chaparral Lake	15060106B-0300	Dissolved oxygen, *Escherichia coli* bacteria
Cortez Park Lake	15060106B-0410	Dissolved oxygen, high pH
Gila River From San Pedro River to Mineral Creek	15050100-008	Suspended sediment concentration

Gila River From Centennial Wash to Gillespie Dam	15070101-008	Boron, selenium
Hassayampa River From headwaters to Copper Creek	15070103-007A	Low pH
Mineral Creek From Devils Canyon to Gila River	15050100-012B	Copper, low dissolved oxygen, selenium
Queen Creek From headwaters to mine WWTP discharge	15050100-014A	Copper
Queen Creek From mine WWTP to Potts Canyon	15050100-014B	Copper
Turkey Creek From unnamed tributary at 34°19'28"/112°21'28" to Poland Creek	15070102-036B	Copper, lead
Salt River Watershed		
Apache Lake	15060106A-0070	Low dissolved oxygen
Canyon Lake	15060106A-0250	Low dissolved oxygen
Christopher Creek From headwaters to Tonto Creek	15060105-353	Phosphorus
Five Point Mountain Tributary From headwaters to Pinto Creek	15060103-885	Copper
Pinto Creek From West Fork Pinto Creek to Roosevelt Lake	15060103-018C	Selenium
Salt River From Pinal Creek to Roosevelt Lake	15060106A-004	Suspended sediment concentration
Salt River From Stewart Mountain Dam to Verde River	15060106A-003	Low dissolved oxygen
Tonto Creek From headwaters to unnamed tributary	15060105-013A	Phosphorus, low dissolved oxygen
San Pedro – Willcox Playa – Rio Yaqui Watershed		
Brewery Gulch From headwaters to Mule Gulch	15080301-337	Copper
Mule Gulch From headwaters to above Lavender Pit	15080301-090A	Copper
Mule Gulch From above Lavender Pit to Bisbee WWTP	15080301-090B	Copper
Mule Gulch From Bisbee WWTP to Highway 80 Bridge	15080301-090C	Cadmium, copper, low pH, zinc
San Pedro River From Babocomari Creek to Dragoon Wash	15050202-003	*Escherichia coli* bacteria
San Pedro River From Dragoon Wash to Tres Alamos Wash	15050202-002	Nitrate
San Pedro River From Aravaipa Creek to Gila River	15050203-001	*Escherichia coli* bacteria, selenium

Santa Cruz – Rio Magdalena – Rio Sonoyta Watershed		
Nogales and East Nogales washes From Mexico border to Potrero Creek	15050301-011	Ammonia, chlorine, copper, *Escherichia coli* bacteria
Santa Cruz River From Mexico border to Nogales WWTP	15050301-010	*Escherichia coli* bacteria
Sonoita Creek From 750 feet below Patagonia WWTP discharge to Santa Cruz River	15050301-013C	Low dissolved oxygen, zinc
Upper Gila Watershed		
Blue River From Strayhorse Creek to San Francisco River	15040004-025B	*Escherichia coli* bacteria
Cave Creek From headwaters to South Fork of Cave Creek	15040006-852A	Selenium
Gila River From New Mexico border to Bitter Creek	15040002-004	*Escherichia coli* bacteria, suspended sediment concentration
Gila River From Skully Creek to San Francisco River	15040002-001	Selenium
Gila River From Bonita Creek to Yuma Wash	15040005-022	*Escherichia coli* bacteria
San Francisco River From Blue River to Limestone Gulch	15040004-003	*Escherichia coli* bacteria
Verde Watershed		
East Verde River From Ellison Creek to American Gulch	15060203-022B	Selenium
East Verde River From American Gulch to Verde River	15060203-022C	Arsenic, boron
Oak Creek From headwaters to West Fork Oak Creek	15060202-019	*Escherichia coli* bacteria
Oak Creek From West Fork Oak Creek to tributary at 34º57’09” / 111º 45’13”	15060202-018A	*Escherichia coli* bacteria
Oak Creek From tributary at 34º57’09” / 111º 45’13” to downstream boundary of Slide Rock State Park	15060202-018B	*Escherichia coli* bacteria
Oak Creek From Slide Rock State Park to Dry Creek	15060202-018C	*Escherichia coli* bacteria
Oak Creek From Dry Creek to Spring Creek	15060202-017	*Escherichia coli* bacteria
Spring Creek From Coffee Creek to Oak Creek	15060202-022	*Escherichia coli* bacteria

SURFACE WATERS ADDED TO ARIZONA'S LIST OF IMPAIRED WATERS BY EPA ***These assessment units were assessed as impaired by EPA in 2002 or 2004.*** ***They remain on Arizona's list of impaired waters until EPA determines that they are no longer im*paired.**		
Surface Water	**Reach or Lake Number**	**Pollutants or Parameters of Concern**
Bill Williams Watershed		
Alamo Lake	15030204-0040	Mercury in fish tissue
Boulder Creek From unnamed wash at 34°41'14"/113°03'34" to Wilder Creek	15030202-006B	Mercury
Boulder Creek From Wilder Creek to Butte Creek	15030202-005A	Mercury
Burro Creek From Boulder Creek to Black Canyon Creek	15030202-004	Mercury
Coors Lake	15030202-5000	Mercury in fish tissue
Colorado – Grand Canyon Watershed		
Colorado – Lower Gila Watershed		
Painted Rock Borrow Pit Lake	15070201-1010	DDT metabolites, toxaphene and chlordane in fish tissue
Little Colorado – San Juan Watershed		
Bear Canyon Lake	15020008-0130	Low pH
Lake Mary (lower)	15020015-0890	Mercury in fish tissue
Lake Mary (upper)	15020015-0900	Mercury in fish tissue
Little Colorado River From Silver Creek to Carr Wash	15020002-004	Sediment
Long Lake (lower)	15020008-0820	Mercury in fish tissue
Lyman Lake	15020001-0850	Mercury in fish tissue
Soldier's Annex Lake	15020008-1430	Mercury in fish tissue
Soldier's Lake	15020008-1440	Mercury in fish tissue
Middle Gila Watershed		
Gila River Salt River - Agua Fria River	15070101-015	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Agua Fria River - Waterman Wash	15070101-014	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Waterman Wash - Hassayampa River	15070101-010	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Hassayampa River - Centennial Wash	15070101-009	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Centennial Wash - Gillespie Dam	15070101-008	DDT metabolites, toxaphene and chlordane in fish tissue

Gila River Gillespie Dam - Rainbow Wash	15070101-007	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Rainbow Wash - Sand Tank	15070101-005	DDT metabolites, toxaphene and chlordane in fish tissue
Gila River Sand Tank - Painted Rocks Reservoir	15070101-001	DDT metabolites, toxaphene and chlordane in fish tissue
Hassayampa River Buckeye Canal – Gila River	15070103-001B	DDT metabolites, toxaphene and chlordane in fish tissue
Painted Rocks Reservoir	15070101-1020A	DDT metabolites, toxaphene and chlordane in fish tissue
Salt River 23rd Ave WWTP - Gila River	15060106B-001D	DDT metabolites, toxaphene and chlordane in fish tissue
Salt River Watershed		
Crescent Lake	15060101-0420	High pH
Tonto Creek From headwaters to unnamed tributary	15060105-013A	Low dissolved oxygen
San Pedro – Willcox Playa – Rio Yaqui Watershed		
Brewery Gulch From headwaters to Mule Gulch	15080301-337	Copper
Mule Gulch From above Lavender Pit to Bisbee WWTP	15080301-090B	Low pH
Santa Cruz – Rio Magdalena – Rio Sonoyta Watershed		
Parker Canyon Lake	15050301-1040	Mercury in fish tissue
Rose Canyon Lake	15050302-1260	Low pH
Upper Gila Watershed		
Gila River From Bonita Creek to Yuma Wash	15040005-022	Sediment
San Francisco River From headwaters to New Mexico border	15040004-023	Sediment
Verde Watershed		
Granite Creek From headwaters to Willow Creek	15060202-059A	Low dissolved oxygen
Watson Lake	15060202-1590	High, ph, low dissolved oxygen, nitrogen
Whitehorse Lake	15060202-1630	Low dissolved oxygen

ADEQ's 2006/2008 TMDL Prioritization and Schedule			
ASSESSMENT UNIT	**POLLUTANT (YEAR LISTED)**	**DISCUSSION**	**PRIORITY RANKING AND TMDL SCHEDULE**
Bill Williams Watershed			
Alamo Lake 15030204-0040 1,414 acres	Ammonia (2004), high pH (1996) low dissolved oxygen (2006)	Low dissolved oxygen, ammonia, and high pH may be symptoms of narrative nutrient violations, and may indicate that toxic conditions are occurring for lake aquatic life. New narrative nutrient implementation procedures have been drafted, and once adopted should be applied to this lake. Ongoing monitoring by the US Fish and Wildlife Service (contracted by the US Army Corps of Engineers) should provide data needed to support TMDL development.	Medium. Initiate in 2008. Complete in 2010.
Bill Williams River From Alamo Lake to Castaneda Wash 15030204-003 35.9 miles	Ammonia, low dissolved oxygen, high pH (2006)	Ammonia is considered toxic to aquatic life and low dissolved oxygen and high pH may pose further stresses on the aquatic community. These stressors are generally associated with excess nutrients	Medium. Initiate in 2008. Complete in 2010.
Santa Maria River From Little Sycamore Creek to Little Shipp Wash (15030203-013) 6.8 miles	Mercury (2006)	Water in the Santa Maria River flows to Lake Alamo, which has a fish consumption advisory for mercury. This drainage receives runoff from historic mining sites. Mercury loadings to these reaches should be addressed in the Alamo Lake mercury TMDL currently being developed. Therefore, development of a separate mercury TMDL for these reaches is a low priority.	Low. Initiate in 2010. Complete in 2012.
Colorado – Grand Canyon Watershed			
Colorado River From Lake Powell to Paria River 14070006-001 16 miles	Selenium (2006)	This TMDL will be complex due to the size of the drainage area, natural background in this geology, and contributions from other states and Indian lands. The two federally protected species occur in this area (humpback chub and razorback sucker) should not be negatively impacted by this concentration of selenium. ADEQ will coordinate development of selenium TMDLs along the Colorado.	Low. Initiate in 2008 Complete in 2010.
Colorado River From Parashant Canyon to Diamond Creek 15010002-003 28 miles	Selenium (2004), suspended sediment concentration (2004)	Development of this TMDL will be complex due to the size of the drainage area, natural background in this sandstone geology, and contributions from other states and Indian lands. Two federally protected species occur in this area (humpback chub and razorback sucker), but they should not be negatively impacted by the suspended sediment or this concentration of selenium. Dates chosen reflect that ADEQ will be coordinating development of selenium TMDLs along the Colorado River.	Low. Initiate in 2008. Complete in 2010.

Paria River From Utah border to Colorado River 14070007-123 29 miles	Suspended sediment concentration (2004)	Prior monitoring and investigations in this drainage should help support TMDL development; however, further investigation is needed to determine source loadings, especially contributions from natural background in this sandstone geology. Source contributions from Utah may also make this TMDL more complex.	Low. Initiate in 2010. Complete by 2012.
	E. coli bacteria (2006)	Exceedances of *Escherichia coli* criteria may represent a significant public health concern if people are swimming or even wading in the water; however, this is a relatively remote canyon, with light recreational use. This TMDL is complex due to source contributions from Utah.	Medium. Initiate in 2010 Complete in 2012.
Virgin River, From Beaver Dam Wash to Big Bend Wash 15010010-003 10 miles	Selenium (2004), suspended sediment concentration (2004)	Further investigation is needed to determine selenium source loadings. Ongoing monitoring by the U.S. Geological Survey. Determining contributions from Utah and from natural background in this sandstone geology will make developing this TMDL more complex. Federally protected Virgin River chum and woundfin occur in this area but should not be negatively impacted by this concentration of selenium or suspended sediment. Dates chosen reflect that ADEQ will be coordinating development of selenium TMDLs along the Colorado River, including the Virgin River.	Low. Initiate in 2008. Complete in 2010.
Colorado – Lower Gila Watershed			
Colorado River From Hoover Dam to Lake Mohave 15030101-015 40 miles	Selenium (2004)	The federally protected Yuma clapper rail occurs in this area and could be negatively impacted by elevated levels of selenium as it bioaccumulates in prey species. Long-term monitoring by U.S. Geological Survey should support TMDL development; however, the TMDL will be complex due to contributions from natural sources and other states. Dates chosen reflect that ADEQ will be coordinating development of selenium TMDLs along the Colorado River.	High. Initiate in 2008. Complete in 2010.
Colorado River From Main Canal to Mexico border 15030107-001 32 miles	Selenium (2006)	The federally protected Yuma clapper rail occurs in this area and could be negatively impacted by elevated levels of selenium as it bioaccumulates in prey species. These TMDLs may be complicated by the large number of potential sources as the Colorado River drainage area covers many states in the Southwest. Dates chosen reflect that ADEQ will be coordinating development of selenium TMDLs along the Colorado River.	High. Initiate in 2008. Complete in 2010.
	Low dissolved oxygen (2006)	Low dissolved oxygen may be a symptom of excess nutrient loadings, and may be stressful to aquatic life. These TMDLs may be complicated by the large number of potential sources as the Colorado River drainage area covers many states in the Southwest.	Low. Initiate in 2008 Complete in 2010.

Gila River From Coyote Wash to Fortuna Wash 15070201-003 28 miles	Boron and selenium (2004)	The federally protected Yuma clapper rail occurs in this area and could be negatively impacted by elevated levels of selenium as it bioaccumulates in prey species. Boron may impact downstream agricultural uses, but present a low ecological and human health risk. Both elevated selenium and boron may be associated with the extensive irrigated agriculture in the greater Yuma area.	High. Initiate in 2008. Complete in 2010.
Painted Rocks Borrow Pit Lake 15070201-1010 180 acres	Low dissolved oxygen (1992)	A diagnostic feasibility study by ADEQ in 1992 concluded that the design and maintenance of this shallow lake was the primary cause of the low dissolved oxygen. Drought conditions have left the lake dry during most of the past five years. The lake is no longer stocked with fish and does not have recreational uses because of the pesticide contamination.	Low. TMDL will be initiated when the lake refills and representative samples can be collected.
Little Colorado Watershed			
Little Colorado River, From Silver Creek to Carr Wash 15020002-004 6 miles	*E. coli* bacteria (2004), suspended sediment concentration (2006)	Exceedances of *Escherichia coli* criteria may represent a significant public health concern if people are swimming or even wading in the water. Exceedances may be related to wet weather events. The drainage is more than 8,000 square miles, so determining the source of contamination may be complex. Substantial monitoring data is needed to identify sources.	High. Initiate in 2007. Complete in 2009.
Little Colorado River From Porter Tank Draw to McDonalds Wash 15020008-017 17 miles	Copper and silver (1992)	Copper and silver concentrations may be toxic to aquatic life. Little Colorado spine dace, a federally protected species, occurs in this reach and may be negatively impacted by the copper and silver. Data from a USGS study concluded that the metals may be naturally elevated; however, sources and natural background concentrations need to be further studied. The nature of these pollutants also makes this study complex.	High. Initiate in 2007. Complete in 2009.
	Suspended sediment concentration (2004)	Little Colorado spine dace, a federally protected species, occurs in this reach but should not be negatively impacted by the suspended sediment concentration. This TMDL is complex due to the size of the drainage area. Dates reflect that both TMDLs will be developed at the same time.	Medium Initiate in 2007. Complete in 2009.
Middle Gila Watershed			
Alvord Park Lake 15060106B-0050 27 acres	Ammonia (2004)	Ammonia poses a significant threat to aquatic life due to its toxic nature. This lake is an important urban recreational area. More investigation is needed to determine the source of the pollutants.	High. Initiate in 2007. Complete in 2009.

Chaparral Lake 15060106B-0300 13 acres	Low dissolved oxygen (2004)	Narrative nutrient implementation guidance, when adopted, will be used to determine if the low dissolved oxygen is related to excess nutrients in the lake. Excess nutrient loads and low dissolved oxygen can stress aquatic life and would be detrimental to this important urban recreational area. Investigation and monitoring is needed to identify sources. Dates reflect that nutrient TMDL development will be coordinated at Phoenix metropolitan area lakes.	Medium. Initiate in 2007. Complete in 2009.
	E. coli bacteria (2004)	Although exceedances of *E. coli* bacteria represent a risk to public health, swimming or wading in the lake are prohibited. However, this is an important recreational area. Dates reflect that TMDL development will be coordinated.	Medium. Initiate in 2007. Complete in 2009.
Cortez Park Lake 15060106B-0410 2 acres	High pH, low dissolved oxygen (2004)	Narrative nutrient implementation guidance, when adopted, will be used to determine if the low dissolved oxygen and high pH is related to excess nutrients in the lake. Excess nutrient loads are stressful to aquatic life and would be detrimental to this important urban recreational area. Dates reflect that nutrient TMDL development will be coordinated at Phoenix metropolitan area lakes.	Medium. Initiate in 2007. Complete in 2009.
Gila River From San Pedro River to Mineral Creek 15050100-008 19.8 miles	Suspended sediment concentration (2006)	Sediment may pose a threat to aquatic life. Extensive monitoring will be needed to determine sources. TMDL may be complex due to the size of the watershed. ADEQ will coordinate development of this TMDL with other suspended sediment TMDLs on the Gila River (see Upper Gila Watershed).	Low. Initiate 2009 Complete 2011.
Gila River From Centennial Wash to Gillespie Dam 15070101-008 5 miles	Boron (1992), selenium (2004)	The federally protected Yuma clapper rail and Southwest willow flycatcher have been found in this area and could be negatively impacted by elevated selenium. Elevated boron can reduce crop production. Both pollutants may be associated with the extensive agriculture in the area; however, TMDL may be complex due to the large number of potential sources and seasonal influences. ADEQ will coordinate with boron and selenium TMDLs downstream on Gila River near Dome.	High. Initiate in 2007. Complete in 2009.
Hassayampa River From headwaters to Copper Creek 15070103-007A 11.0 miles	Low pH (2006)	Cadmium, copper, and zinc TMDLs were completed in 2002. Actions to reduce metal loads will also address the low pH; therefore, development of a pH TMDL is a low priority.	Low. Initiate in 2011. Complete in 2013.
Mineral Creek From Devils Canyon to Gila River 15050100-012B 19.6 miles	Copper (1992), selenium (2004)	Mining operation is under consent decree to mitigate copper issues so TMDL is not required. Mining operation has been collecting samples to determine sources of selenium and causes of low dissolved oxygen. Mine will be submitting plans and initiating actions to mitigate increases in selenium concentrations within the diversion tunnel. When submitted, ADEQ will to move this to category 4B.	Medium. Initiate in 2007. Complete in 2009.
	Low dissolved oxygen (2006)		Low. Initiate in 2007. Complete in 2009.

Queen Creek From headwaters to Potts Canyon 15050100-014A and 15050100-014B 15 miles (total)	Copper (reach 014A 2002; reach 014B; 2004)	TMDL in progress. Copper poses a risk to aquatic life and wildlife. The TMDL is being developed and should be completed in 2007.	High. Initiated in 2004. Complete in 2009.
Turkey Creek From unnamed tributary to Poland Creek 15070102-036B 21.0 miles	Copper (1992) and lead (2004)	TMDL undergoing final review and approval. When approved, this reach will be moved to category 4A.	High. Initiated in 2000. To be completed in 2009.
Salt Watershed			
Christopher Creek From headwaters to Tonto Creek 15060105-353 8.0 miles	Phosphorus (2006)	*E. coli* bacteria TMDLs were completed in 2004. Actions to reduce *E. coli* bacteria loadings will also reduce phosphorus loadings; therefore, development of a phosphorus TMDL is a low priority. Will coordinate with Tonto Creek TMDLs.	Low. Initiate in 2010 Complete in 2012.
Salt River and its reservoirs 1. Apache Lake 15060106A-0070 2190 acres 2. Canyon Lake 15060106A-0250 450 acres 3. Salt River From Stewart Mountain Dam to Verde River 15060106A-003 10.1 miles	Low dissolved oxygen (2004 – Canyon Lake and Salt River) (2006 – Apache Lake)	Low dissolved oxygen can be a symptom of excess nutrient loads. Such loadings can be stressful to aquatic life and even lead to fish kills, which would be detrimental to this important recreational area. The federally protected Yuma clapper rail and bald eagle in this area should not be negatively impacted by the low dissolved oxygen. Narrative nutrient implementation guidance, when adopted, will be used to determine if the low dissolved oxygen is related to excess nutrients in the lake. ADEQ intends to change the designated use from A&Wc to A&Ww during the ongoing triennial review of surface water quality standards, which will reduce the number of exceedances. ADEQ intends to coordinate development of TMDLs within the Salt River chain of reservoirs.	Medium. Initiate in 2009. Complete in 2011.
Five Point Mountain Tributary From headwaters to Pinto Creek 15060103-885 2.9 miles	Copper (2006)	Site specific criteria for copper are currently being developed in support of a Phase II Copper TMDL. The federally protected Colorado pikeminnow occurs in this area and could be negatively impacted by the copper. There is wide public support for development of TMDLs in Pinto Creek.	High. Initiated in 2004. Complete TMDL once site specific criteria are adopted in ongoing triennial review (2008). Phase II copper TMDL to be completed in 2009.
Pinto Creek From West Fork Pinto Creek to Roosevelt Lake 15060103-018C 33 miles	Selenium (2004)	The federally protected Colorado pikeminnow and bald eagle both occur in this area and could be negatively impacted by the selenium. There is wide public support for development of TMDLs in Pinto Creek. Monitoring to support the Phase II copper TMDL should also be useful in completing the selenium TMDL.	High. Initiate in 2008. Complete in 2010.
Salt River From Pinal Creek to Roosevelt Dam 15060103-004 7.5 miles	Suspended sediment concentration (2006)	Elevated suspended sediment can have negative impacts on aquatic life, especially during critical periods of reproduction. Sediment may be transporting pollutants into Roosevelt Lake, an important reservoir and recreational area.	Medium. Initiate in 2010 Complete in 2012.

Tonto Creek From headwaters to unnamed tributary 15060105-013A 8.1 miles	Phosphorus, low dissolved oxygen (2006)	Nitrogen and *E. coli* bacteria TMDLs were completed in 2004. Actions to reduce nitrogen and *E. coli* bacteria loadings will also reduce phosphorus loadings; therefore, development of the phosphorus TMDL is a low priority. Will coordinate with Christopher Creek TMDL.	Low. Initiate in 2010 Complete in 2012.
San Pedro Watershed			
Brewery Gulch From headwaters to Mule Gulch 15080301-337 1 mile	Copper (2006)	Part of Mule Gulch TMDL (see below).	
Mule Gulch From headwaters to Lavender Pit 15080301-090A 3 miles	Copper (1990)	Part of Mule Gulch TMDL (see below).	
Mule Gulch Lavender Pit to Bisbee WWTP discharge 15080301-090B 0.8 miles	Copper (1990)	Part of Mule Gulch TMDL (see below).	
Mule Gulch From Bisbee WWTP discharge to Highway 80 bridge 15080301- 090C 3.8 miles	Cadmium, copper, low pH, and zinc (1990)	Currently establishing site-specific criteria in support of a TMDL. This metal contamination represents a significant threat to wildlife and human health due to the magnitude and frequency of the exceedances. This TMDL involves a large and heavily impacted mining area, where site-specific standards need to be developed before the TMDL can be completed. Long term drought conditions have increased the difficulty collecting samples to identify sources and to model loadings.	Medium. Initiated in 2000. Complete TMDL after site specific criteria are adopted in ongoing triennial review (2009).
San Pedro River From Babocomari Creek to Dragoon Wash 15050202-003 17 miles	*E. coli* bacteria (2004)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The TMDL may be complicated due to the size of the watershed and drainage from Mexico. Monitoring will be coordinated with other TMDLs along the San Pedro.	High. Initiated in 2006. Complete in 2009.
San Pedro River From Dragoon Wash to Tres Alamos Wash 15050202-002 16 miles	Nitrate (1990)	ADEQ's WQARF (superfund cleanup) Program is working with this site. The facility has instituted several actions to bring the surface and ground water into compliance with its standards and is conduction monitoring at several sites along the San Pedro River. Although surface water quality is improving, cleanup will take time as there is significant contamination of ground water, which seeps into the San Pedro.	Low. Ongoing Superfund remediation and monitoring. Will Initiate TMDL if WQARF cleanup is not effective.

San Pedro River From Aravaipa Creek to Gila River 15050203-001 14.8 miles	*E. coli* bacteria (2004)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The large drainage area may make identifying sources more difficult. Monitoring will be coordinated with other TMDLs in the San Pedro.	High. Initiated in 2006 Complete in 2009.
	Selenium (2004)	The federally protected bald eagle and Southwest willow flycatcher found in this area may be negatively impacted by the elevated selenium. The large drainage area may make identifying sources more difficult. Monitoring will be coordinated with other TMDLs in the San Pedro.	High. Initiated in 2006. Complete in 2009.
Santa Cruz Watershed			
Nogales and East Nogales Wash 15050301-011 6 miles	Ammonia (2004), chlorine (1996), Copper (2004), *E. coli* bacteria (1998)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. Ammonia, chlorine, copper, and low dissolved oxygen are significant threats to aquatic life. The Pollutant sources are known – deteriorated infrastructure in Mexico that sends raw sewage into Arizona. Implementing corrective actions requires funding and is dependent on international negotiations. Chlorine is added to the raw sewage due to human health concerns. TMDLs will be developed if needed after facility upgrades are complete.	Low. Necessity of TMDL development is based on outcome of current international discussions regarding infrastructure upgrades.
Santa Cruz River Mexico border – Nogales WWTP 15050301-010 17 miles	*E. coli* bacteria (2002)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The Friends of the Santa Cruz is interested in maintaining high quality water in the Santa Cruz River and Nogales Wash area. Several years of drought has interfered with collecting samples to determine source loadings. TMDL may be more complex because sources contributions may be in Mexico.	High. Stream has been dry most of the time since 2002. Will Initiate TMDL when steady flow resumes. Complete within 2 years of initiating monitoring.
Sonoita Creek From 750 feet below WWTP to Patagonia Lake 15050301-013C 9 miles	Zinc (2004)	The federally protected Gila topminnow occurs in this reach and could be negatively impacted by dissolved zinc. Source of zinc has not been investigated; however, zinc is impairing both Alum Wash and Three R Canyon, which are tributaries located upstream (TMDLs completed on those tributaries in 2003).	High. Initiate in 2006. Complete in 2009.
	Low dissolved oxygen (2006)	The federally protected Gila topminnow occurs in this reach and could be negatively impacted by low dissolved oxygen. The low dissolved oxygen occurs immediately below the Patagonia WWTP discharge and in an area of ground water upwelling.	High. Initiate in 2006. Complete in 2009.

Upper Gila Watershed			
Blue River From Strayhorse Creek to San Francisco River 15040004-025B 25.4 Miles	*E. coli* bacteria (2006)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. Monitoring is needed to determine sources of bacterial contamination. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries.	High. Initiate in 2008 Complete in 2010.
Cave Creek From headwaters to South Fork of Cave Creek 15040006-852A 8 miles	Selenium (2004)	Selenium may be toxic to aquatic life or species that feed on them. This stream is classified as a unique water. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. Initial investigations and monitoring indicates that sources are likely natural; therefore, TMDL development has a lower priority.	Medium. Initiate in 2006. To complete in 2008.
Gila River From New Mexico border to Bitter Creek 15040002-004 16.3 miles	*E. coli* bacteria (2006)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. The TMDL is complex due to the size of the watershed (nearly 8000 square miles extending into New Mexico).	High. Initiate in 2006 Complete in 2009.
	Suspended sediment concentration (2006)	Suspended sediment may pose a risk to aquatic life. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. The TMDL is complex due to the size of the watershed that extends into New Mexico (nearly 8,000 square miles). TMDL development along the Gila River will be coordinated.	Low. Initiate in 2006 Complete in 2009.
Gila River From Skully Creek to San Francisco River 15040002-001 15 miles	Selenium (2004)	Selenium may be toxic to aquatic life or species that feed on them. The selenium is only slightly over the water quality criteria, so may not negatively impact the federally protected spike dace and loach minnow that occur in this area. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. The TMDL is complex due to the size of the watershed that extends into New Mexico (nearly 8,000 square miles). Dates reflect that TMDL development along the Gila River will be coordinated.	Medium. Initiate in 2006 Complete in 2009.
Gila River From Bonita Creek to Yuma Wash 15040005-022 6 miles	*E. coli* bacteria (2004)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. The TMDLs are complex due to the size of the watershed that extends into New Mexico (nearly 8,000 square miles).	High. Initiate in 2006. Complete in 2009.

San Francisco River From Blue River to Limestone Gulch 15040004-003 18.7 miles	*E. coli* bacteria (2006)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries.	High. Initiate in 2008 Complete in 2010.
Verde Watershed			
East Verde River From Ellison Creek to American Gulch 15060203-022B 20 miles	Selenium (2004)	Selenium may be toxic to aquatic life or species that feed on them. Monitoring is needed to determine source loadings and contribution from natural sources. The selenium is only slightly over the water quality criteria, so it is not known whether federally protected Gila trout occurs in this area will be negatively impacted by the elevated selenium.	Low. Initiate in 2010. Complete in 2012.
East Verde River From American Gulch to Verde River 15060203-022C 26 miles	Arsenic and boron (2006)	Arsenic and boron may present public health risks to people using this segment as a drinking water source or for swimming. This segment is near Payson, Arizona, and provides important recreational opportunities.	High. Initiate in 2006 Complete in 2009.
Bacteria TMDL 1. Oak Creek From headwaters to Spring Creek 15060202-019, 018A, 018B, 018C, 017 43 miles (total) 2. Spring Creek From Coffee Creek to Oak Creek 15060202-022 6.4 miles	*E. coli* bacteria (1992 – 018B) (2006 – additional segments)	Exceedances of *Escherichia coli* bacteria criteria may represent a public health concern if people are swimming or even wading in the water. Monitoring during the ongoing Phase II *E. coli* TMDL has shown that bacteria contamination occurs in more reaches of Oak Creek and some of its tributaries. Complex TMDL due to potential sources within the watershed, heavy recreational use during summer holidays, and natural bacterial contamination during runoff events.	High. Initiated Phase II *E. coli* TMDL in 2004. Complete in 2008.

EPA's 2004 TMDL Prioritization and Schedule

ASSESSMENT UNIT	POLLUTANT (YEAR LISTED)	DISCUSSION	PRIORITY RANKING AND TMDL SCHEDULE
Bill Williams Watershed			
Alamo Lake 15030204-0040 1,414 acres	Mercury (in fish tissue) (2002)	A mercury fish consumption advisory was issued in 2004. Fish in this lake are also a food source for the bald eagle, a federally listed as Threatened species. The lake supports significant sport fishing. A mercury TMDL was initiated in 2004 and is expected to be approved in 2006. ADEQ is currently collecting atmospheric deposition data for mercury.	High. Initiated in 2004. To complete in 2007.

Boulder Creek From unnamed tributary to Wilder Creek 15030202-006B 14.4 miles Boulder Creek From Wilder Creek to Butte Creek 15030202-005A 1.4 miles Burro Creek From Boulder Creek to Black Canyon Creek 15030202-004 17.2 miles	Mercury (2004)	Although fishing is unlikely due to the intermittent nature of this low desert stream, water in Boulder Creek flows to Lake Alamo, which has a fish consumption advisory for mercury. Mercury loadings from the Burro Creek/Boulder Creek area will be addressed in the Alamo Lake mercury TMDL currently being developed. Remediation actions on tailings piles along Boulder Creek should help reduce mercury loadings. Therefore, development of a mercury TMDL here is a lower priority.	Low. Initiate in 2010. Complete in 2012.
Coors Lake 15030202-5000 230 acres	Mercury (in fish tissue) (2004)	Coors Lake is on Butte Creek, a tributary to Boulder Creek (listed above). A fish consumption advisory due to mercury contamination was issued in 2004. Lower priority ranking is contingent on restricting fishing at this privately owned lake.	Medium. Initiate in 2010. Complete in 2012.
Colorado – Grand Canyon Watershed			
Colorado – Lower Gila Watershed			
Painted Rocks Borrow Pit Lake 15070201-1010 180 acres	DDT metabolites, toxaphene, chlordane in fish tissue (2002)	(See discussion and schedule in Middle Gila – Painted Rocks Pesticide Contamination)	High. TMDL will be coordinated with pesticide TMDLs in the Middle Gila.
Little Colorado Watershed			
Bear Canyon Lake 15020008-0130 55 acres	Low pH (2004)	This is an important fishing and recreational area. High pH may be a symptom of narrative nutrient violations and may stress aquatic life in the lake. Narrative nutrient implementation guidance, when adopted, will be used to determine if high pH values are related to excess nutrients. Investigation and monitoring is needed to identify sources.	Low. Initiate in 2007 To complete in 2009.
Regional mercury TMDL 1. Lake Mary, Upper 15020015-0900 860 acres 2. Lake Mary, Lower 15020015-0890 765 acres 3. Long Lake 15020008-0820 320 acres 4. Soldiers Lake 15020008-1430 28 acres 5. Soldiers Annex Lake 15020008-1440 120 acres	Mercury in fish tissue (Upper and Lower Lake Mary 2002; Long Lake, Soldiers Lake and Soldiers Annex Lake 2004)	Mercury fish consumption advisories were issued at all 5 of these lakes in 2002-2003. Excess mercury in fish tissue can be toxic to humans and other animals that eat the fish. These lakes are important recreational resources. ADEQ is currently collecting atmospheric deposition data in support of mercury TMDLs and plans This regional mercury TMDL is to be completed in 2006.	High. Initiated in 2003. To complete in 2007.

Lyman Lake 15020001-0850 1308 acres	Mercury in fish tissue (2004)	A fish consumption advisory for mercury was issued in 2002. Excess mercury in fish tissue can be toxic to humans and other animals that eat the fish. This lake is an important recreational area. Additional monitoring is needed to identify sources.	Medium. Initiate in 2008 To complete in 2010.
Little Colorado River, From Silver Creek to Carr Wash 15020002-004 6 miles	Sediment (2004)	Sediment may pose a risk to aquatic life. The TMDL will be complex due to the size of the watershed (nearly 8,000 square miles). ADEQ will coordinate with *E. coli* listing (state listing with high priority) when developing the TMDL. This may change its priority.	Low. Initiate in 2007. Complete in 2009.
Middle Gila Watershed			
Pesticide Contamination Area: A. Painted Rocks Reservoir 15070101-1020A 100 acres B. Painted Rocks Borrow Pit Lake 15070201-1010 185 acres C. Gila River reaches from Salt River to Painted Rocks Reservoir 15071010-015, 014, 010, 009, 008, 007, 005, 001 83 miles (total) D. Salt River, Below 23rd Ave WWTP 15060106B-001D 14.1 miles E. Hassayampa River below Buckeye Canal 15070103-001B 2.3 miles	DDT metabolites, toxaphene, and chlordane in fish tissue (2002)	These pesticides still present a high risk to aquatic life and species that prey on them, including humans. A fish consumption advisory is issued. Federally protected Yuma clapper rail and Southwest willow flycatchers sighted in this area could be negatively impacted by the pesticides. This will be a very complex TMDL due to the size of the drainage area and potential sources. This TMDL will require significant monitoring resources to determine any current sources of these historically used pesticides. These pesticides have been banned from use for more than 30 years.	High. Initiate in 2008. To complete in 2010.
Salt Watershed			
Crescent Lake 15060101-0420 157 acres	High pH (2002)	Excess nutrient loads can lead to fish kills, which would be detrimental to this important recreational area. Investigation and monitoring is needed to identify sources. Narrative nutrient implementation guidance, when adopted, will be used to determine if the high pH is related to excess nutrients in the lake.	Medium. Initiate in 2010. To complete in 2012.
Tonto Creek From headwaters to unnamed tributary 15060105-013A 8.1 miles	Low dissolved oxygen (2004)	Nitrogen and *E. coli* bacteria TMDLs were completed in 2004. Actions to reduce nitrogen and *E. coli* loadings will also increase dissolved oxygen; therefore, development of a dissolved oxygen TMDL is a lower priority at this time.	Medium. Initiate in 2010. To complete in 2012.

San Pedro Watershed			
Brewery Gulch From headwaters to Mule Gulch 15080301-337 1 mile	Copper (2004)	Part of Mule Gulch TMDL (see below).	
Mule Gulch Lavender Pit to Bisbee WWTP discharge 15080301-090B 0.8 miles	Low pH (2002)	Currently establishing site-specific copper criterion in support of a TMDL. This metal contamination represents a significant threat to wildlife and human health due to the magnitude and frequency of the exceedances. This TMDL involves a large and heavily impacted mining area, where site-specific standards need to be developed before the TMDL can be completed. Long term drought conditions have increased the difficulty collecting samples to identify sources and to model loadings.	Medium. Initiated in 2000. Complete TMDL after site specific criteria are established in ongoing triennial review (2007).
Santa Cruz Watershed			
Parker Canyon Lake 15050301-1040 130 acres	Mercury in fish tissue (2004)	Fish consumption advisory issued. Excess mercury in fish tissue can be toxic to humans and other animals that eat the fish. Lake is an important recreational area. Additional monitoring is needed to identify sources. ADEQ will be collecting atmospheric deposition data in support of mercury TMDLs.	Medium. Initiated in 2006. To complete in 2009.
Rose Canyon Lake 15050302-1260 7 acres	Low pH (2004)	Low pH poses risks to aquatic life because it allows the release of toxic metals from the lake bottom sediments into the water column. A major wildfire occurred in 2003 in the drainage area of this small, deep recreational attraction on Mount Lemmon. Although exceedances occurred prior to the fire, the TMDL will also need to look at long term impacts of this fire on lake pH.	Low. Initiate in 2009. To complete in 2011.
Upper Gila Watershed			
Gila River From Bonita Creek to Yuma Wash 15040005-022 6 miles	Sediment (2004)	Sediment may pose a risk to aquatic life. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries. The TMDLs are complex due to the size of the watershed that extends into New Mexico (nearly 8,000 square miles). ADEQ will coordinate with *E. coli* TMDL on the same reach.	Low. Initiated in 2006. To complete in 2009.
San Francisco River From Headwaters to New Mexico Border 15040004-023 13.1 miles	Sediment (2004)	Sediment may pose a risk to aquatic life. The Gila Watershed Partnership is interested in maintaining high quality water in the Gila River and its tributaries.	Low. Initiate in 2008. To complete in 2010.
Verde Watershed			
Granite Creek From headwaters to Willow Creek 15060202-059A 13 miles	Low dissolved oxygen (2004)	Low dissolved oxygen maybe related to nutrient loading. Excess nutrient loads can lead to fish kills. Investigation and monitoring is needed to identify sources.	Low. Initiate in 2010 To complete in 2012.

Watson Lake 15060202-1590 150 acres	High pH, low dissolved oxygen, nitrogen (2004)	Excess nutrient loads can lead to fish kills, which would be detrimental to this important recreational area. Use narrative nutrient implementation guidance, when adopted, to determine if excess nutrients are impairing the lake. Investigation and monitoring is needed to identify sources.	Medium. Initiate in 2010. To complete in 2012.
Whitehorse Lake 15060202-1630 40 acres	Low dissolved oxygen (2004)	Low dissolved oxygen may pose risks to aquatic life. (Note that newer data does not indicate impairment)	Medium. Initiate in 2010. To complete in 2012.

8. The name and address of agency personnel with whom persons may communicate regarding the notice of public information:

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The 2006/2008 §303(d) List may be downloaded from the Department's web site at: http://azdeq.gov/environ/water/assessment/assess.html. Copies of the 2006/2008 303(d) List may also be obtained from the Department by contacting the numbers above.